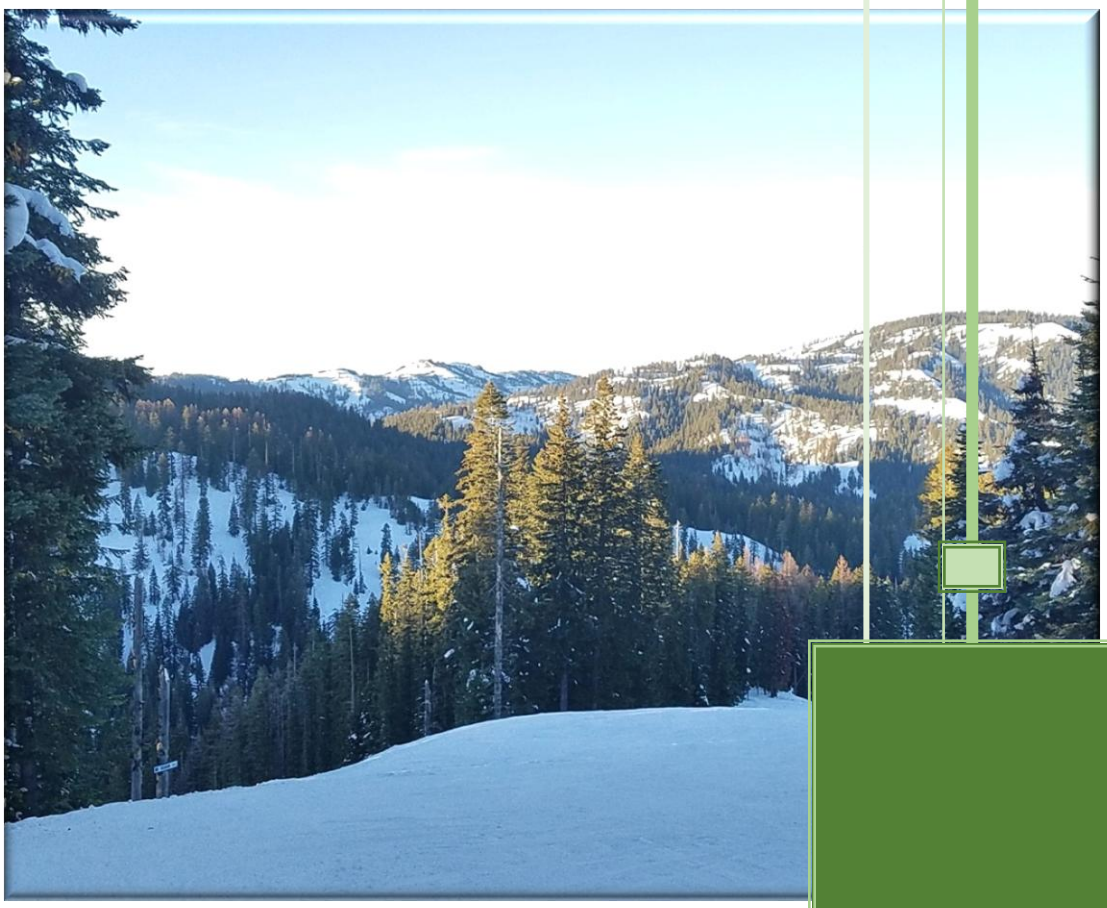
United States Department of Agriculture
Forest Service

UPPER TOUCHET VEGETATION MANAGEMENT PROJECT

ENVIRONMENTAL ASSESSMENT



For More Information Contact:

Michael Rassbach
Walla Walla Ranger District
415 W Rose Street
509-522-6290
mrassbach@fs.fed.us
Fax: 509-533-6000

Image top right is of the layout of Ski Bluewood (Ski Bluewood) and image center is of the typical forested area within the Project area (Jack Comish).

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NOTE: All document citations will be entered in MLA format – see "insert citation" in References function. For citations, only use those that are actually applicable to your analyses of impacts to your resource – do not use multipage reference lists from old docs that you are not directly citing or do not have in hand – if you do use those, you will need to insert each one into the document at the appropriate location by inputting them into References – Citations so they auto populate the references section. DO not add references in the references section – Word 2013 will do it for you.

NOTE: USE REFERENCES FUNCTION IN WORD 2013 THROUGHOUT DOCUMENT TO INCLUDE ALL TABLES, MAPS, FIGURES, PHOTOS, AND CITATIONS – THEY WILL AUTO-POPULATE A CAPTION IN A SEQUENTIAL MANNER AND CREATE A TABLE FOR THE TABLE OF CONTENTS AUTOMATICALLY IN THE FRONT OR END OF THE DOCUMENT AS REQUIRED AS WELL.

CHAPTER 1 PURPOSE AND NEED

1.1 Introduction

The Walla Walla Ranger District is proposing to conduct a vegetation management project on the Umatilla National Forest. The Upper Touchet Project consists of vegetative treatments on the landscape that will accomplish multiple resource objectives in vegetation, fuels, and recreation management. This draft Environmental Assessment (EA) describes the Upper Touchet Vegetation Management Project and presents an analyses of effects to resources as identified by the interdisciplinary team and public as well as the 10 criteria of intensity in the FONSI.

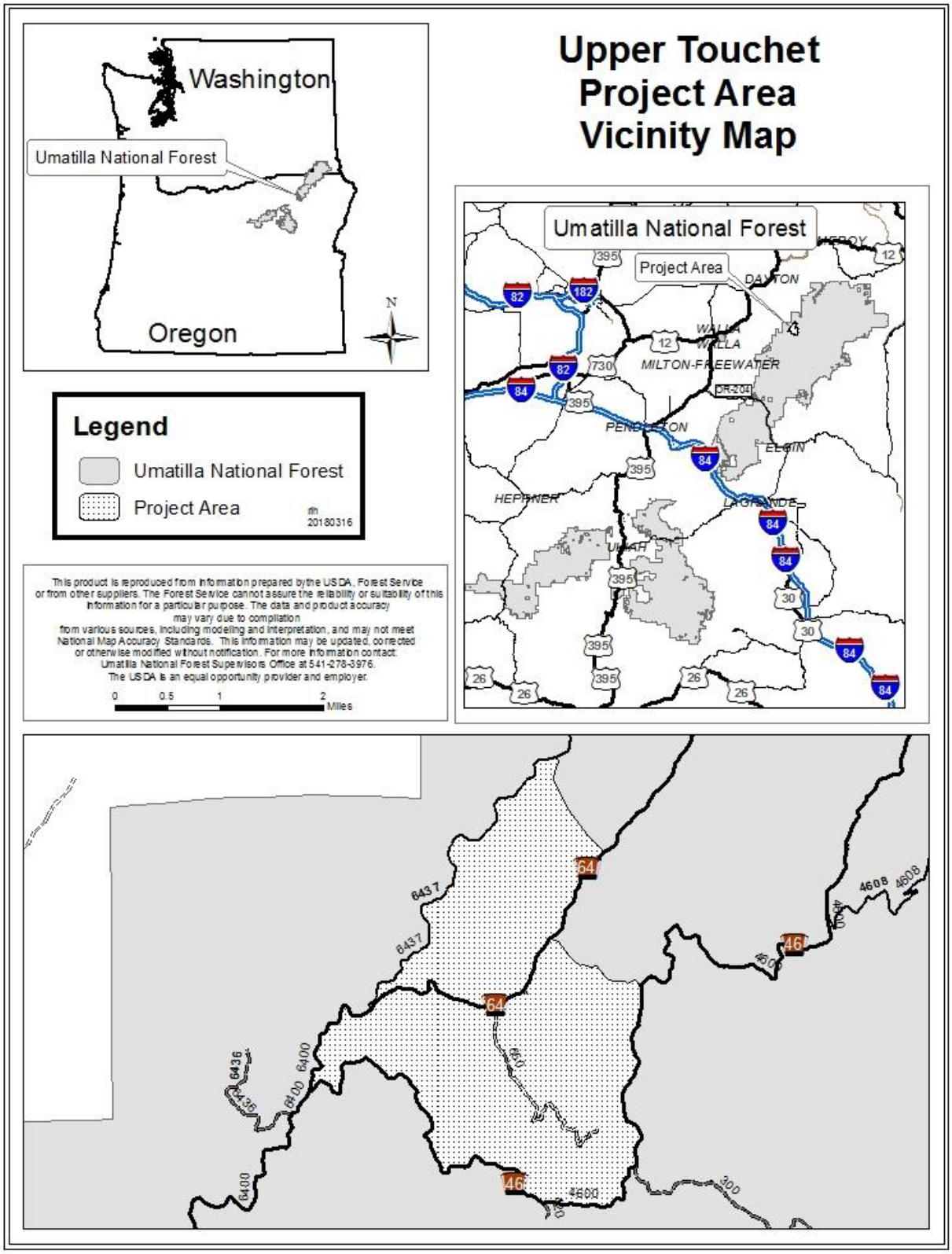
The NEPA project planning area is approximately 4,450 acres of national forest system lands, including 1,480 acres within the boundary of Ski Bluewood Resort under special use permit. This Project will serve to resolve several critical issues with goals focusing on the following: protection of human life and safety; infrastructure and values at risk within and adjacent to the Bluewood special use permit area by decreasing hazards to recreational users and risk of damage to infrastructure and facilities from wildfires; tree thinning, fuels reduction, and prescribed burning proposed to reduce susceptibility of the area to intense wildfire, insects and disease; promotion of forest health and resiliency by treatments that encourage a desired range of forest species cover type, density and structural stage; and decreasing the departure from the natural fire regime to create resilient landscapes.

In accomplishing our objectives within the Project area, the following activities are planned: 1150 acres of commercial harvest; 440 acres of non-commercial treatments (timber stand improvement and fuels treatments); and 1530 acres of prescribed landscape burning; construction of approximately 1.25 miles of temporary roads, that will be decommissioned upon completion of work. There will be no mechanical treatments in Riparian Habitat Conservation Areas (RHCA's). No activities are planned in Wilderness or Inventoried Roadless Areas (IRAs).

This Environmental Assessment (EA) has been prepared to determine whether implementation of the above described activities may substantially, in an adverse or beneficial manner, affect the quality of the human environment such that a Finding Of No Significant Impact (FONSI) cannot be signed and thereby require the preparation of an Environmental Impact Statement (EIS). By preparing this EA, we are fulfilling agency policy and direction to comply with the National Environmental Policy Act (NEPA). The Walla Walla Ranger District review found that the Project is in compliance with the current Forest Plan 1990 (as amended). The proposed treatments would enhance and increase human health and safety, recreation opportunities, infrastructure protection, wildlife connectivity, diversity of available wildlife habitat, diversity of vegetation type and a decrease in fuel loads.

1.1.1 Proposed Action Location

The Upper Touchet project planning area lies within the Walla Walla Ranger District, 20 miles south of Dayton, Washington in the Blue Mountains; with elevations ranging from X to Y feet. Falling within the Upper North Fork Touchet sub- watershed, the Project Area is located at T7, R 39E S12, 13 & R40E S2, 3, 7, 8, 17, 18, 19, 20. See Vicinity Map 1 below.



MAP 1 VICINITY MAP OF PROPOSED PROJECT

Project specific MAP with ski Bluewood defined here.....

1.2 Purpose and Need for the Proposal

Based on input from visitors and the special use permit holder, public comment, Walla Walla Ranger District resource specialist's knowledge, field /site visits, review of Forest Plans, as well as applicable Laws, regulations and policies and other related guidance; we have determined that the purpose and need for this Proposed project is as follows:

Purpose:

To reduce vegetation hazards to ski resort visitors, enhance skiing opportunities to a wider range of capabilities, and improve access to and safety within skiable areas; maintain scenic integrity and stability for visitor enjoyment; reduce the risk of and increase defensibility for wildfire affecting ski resort opportunities, infrastructure, and wildlands in the project area, and improve the resilience of vegetation through management of species, stand density and canopy layering.

Need:

Recreation Management within Permit Area of Ski Bluewood:

- Enhance skiing opportunities by increasing accessibility of skiing terrain and providing a wider variety of skiable terrain to meet the needs of a broad spectrum of ability levels
- Maintain and improve public safety in direct relation to hazard trees and danger trees
- Reduce safety hazards presented to snow recreationalists by height and abundance of down woody debris
- Maintain and enhance scenic integrity and stability within developed recreation area in compliance with Forest standards and guidelines.

Fuels Treatments

- Reduce amount of fuels around structures and ski lifts to improve defensibility of ski area from wildfire
- Move fire regimes of the project area toward condition class 1 because....

Vegetation Needs within the Proposed Project Area:

- Manage areas prone to tree stress and mortality over a large area because of the risk of insect and disease damage
- Manage areas of high susceptibility to crown fire. and too few areas of moderate to low susceptibility... because of ???

Reduce density and canopy layering and proportion of susceptible species... because they are????

1.3 Issues from Scoping Considered for Further Analyses

The Proposed Action was scoped with the public and interested agencies in March of 2018 using a district mailing list and the Schedule of Proposed Actions (SOPA) online. The Forest Service communicated and/or consulted with the special use permit holder, Tribal entities, and Federal and state agencies during the development of this EA. Issues were derived from interdisciplinary team discussions and comments provided by 5 respondents during scoping. Issues regarding temporary roads, large trees, and activities in moist forests, were identified as warranting further consideration. It was determined to bring the Proposed Action forward for further development and to develop two modified Action Alternatives based on the Proposed Action.

CHAPTER 2 ALTERNATIVES

Three alternatives were developed and analyzed, in detail, in response to public comment and interdisciplinary team member research and knowledge. Alternative A is the Proposed Action, Alternative B addresses no construction of temporary roads, and Alterative D addresses no temporary roads or cutting within moist forest. Alterative C, no management of moist forest, was determined not to satisfy the Purpose and Need and was dismissed from further analyses.

2.1 Alternative A Proposed Action

WHO, WHAT, WHERE, WHEN, HOW => PROPOSED ACTION DESCRIPTION

The Walla Walla District proposes to treat approximately 3,120 acres with prescribed burning, commercial tree thinning and non-commercial tree thinning. Connected actions include road maintenance for log haul, use of temporary roads, danger tree removal, and post-harvest fuels treatments. Activities would take place within the Blue wood ski area, which is forest service land under a special use permit for recreation. Activities would also take place in surrounding areas to improve defensibility of the area from strategic locations.

2.1.1 Treatment Descriptions (WHAT/HOW are you going to do...)

TREE CUTTING

Tree cutting activity is proposed on 1,590 acres. Thinning of recently harvested areas with trees averaging less than 5 inches DBH would occur on 440 acres, which are referred to as 'non-commercial' units. Thinning of trees larger than 5 inches DBH would occur on approximately 1,150 acres, which are referred to as 'commercial' value units.

Approximately XX acres would be treated with an intermediate cut. Intermediate treatments in the project would generally involve the cutting and/or burning of approximately 30 to 70% of coniferous trees from a given unit, while retaining enough trees to still meet minimum stocking requirements and preclude substantial tree germination and establishment. In most areas, intermediate treatments are also intended to increase the pace and/or likelihood of old forest creation and development by promoting individual tree vigor and tree species more likely to persist for several decades.

Intermediate treatments include commercial and non-commercial thinning, and improvement cutting. Commercial and non-commercial thinning would reduce stand density and improve stand or tree growth, thereby enhancing forest health while meeting other resource objectives. Primarily less desirable tree species and diseased trees would be removed, with a focus on understory thinning.

Thinning emphasizes increasing the growth, productivity, and vigor of trees in an existing stand of more or less equally desirable trees, while improvement cutting emphasizes improving the overall

composition and tree quality (root, stem, and crown form/vigor) of a residual stand by removing less-desirable trees.

Where feasible, ladder fuel treatment and pull-back of duff and other surface fuels from large old residual trees would be conducted in such a manner as to minimize the possibility of large, old pine mortality caused by smoldering duff consumption during a wildfire or planned landscape burn. These fuel treatments would generally be limited a radius of 10-20 feet around desirable large-tree stems, and are not expected to occur for more than 10-20 leave-trees per acre.

LOGGING SYSTEMS

Ground-based logging on 180 acres would be accomplished with a tractor or skidder or a harvester/forwarder. Tractor or skidder yarding would occur on trails spaced approximately 100 feet apart. Skidding equipment would be required to remain on the trails and logs dragged to the landings with one end suspended. Harvester/forwarder equipment cuts trees, (delimbs?) and places them adjacent to the forwarder routes. Limbs are left on the forwarder route to aid in soil protection. The forwarder would pick up logs, Pile? and haul them to a landing for decking. This is a total log suspension harvest system. Forwarder route spacing would be based on the reach of the felling equipment—typically 40 to 50 feet.

Skyline logging is proposed on 800 acres …

Helicopter logging is proposed on 170 acres. …

LANDINGS

Landings u would be created at approximately a quarter to half an acre in size and would be large enough to pile tops for later burning of piles Forwarder landings would not be constructed because logs would be decked along the edge of roads without removing vegetation.

Helicopter landings ….

Large landings that create significant amounts of bare soil would be replanted to native grasses and forbs.

EROSION CONTROL

Any exposed soil caused from landing activities, harvest operations, or burning of slash would be revegetated with native plants and/or is expected to naturally revegetate.

FUELS TREATMENTS

Fuel treatments are proposed to reduce activity-generated fuels and existing natural fuels across approximately XX acres of harvest units. Treatment activities are also designed to modify ladder and surface fuels outside of harvest units to modify potential fire behavior, particularly in areas where fuels would contribute to undesired/uncharacteristic wildfire intensity and resource damage. Fuel treatments include the following activities, implemented alone or in combination:

WHOLE TREE YARDING: The whole tree will be skidded to a landing where it will be processed and all harvest residues (slash) will be piled. Landing piles would generally be large in size but no larger than ½-acre.

TRACTOR YARDING- TOP ATTACHED: Tops would be left attached to top-logs yarded to the landing and piled after being severed from the attached log. This material may be utilized for biomass products or burned in the pile.

JACKPOT BURNING: This treatment would utilize spot ignitions to reduce or eliminate relatively heavy slash concentrations. This treatment would be applied in units where the fuelbed is discontinuous and fire spread through the unit would be limited. This burning would be conducted by hand with drip-torches.

BROADCAST AND UNDER BURNING: Low-intensity prescribed fire would be applied to a broad area using hand-operated drip torches. This method would be used to favor early seral, fire resistant species composition and structure while reducing surface and ladder fuels. Under burning would be used to reduce activity and natural fuels in harvest units to reduce activity slash and create regeneration/planting spots.

PILING – GRAPPLE: This is a mechanical treatment that lifts forest fuels and lays them in piles. Both naturally occurring woody debris and activity generated fuels would be piled. Chain saws may be used to compact material in piles and throughout the unit and to cut logs in lengths that are more easily piled. Pile sizes would vary but are not expected to exceed XX square feet in size or XX feet in height. This method could be used in place of mastication when surface fuels are not continuous and protection from prescribed fire or wildfire is desired for fire-intolerant trees.

PILING – HAND: Piling fuels by hand would occur near riparian areas, steep slopes, where aesthetic values are important, or where resource values requires a low-impact treatment method. Chain saws may be used to compact material in the pile and pile size would vary.

PILE BURNING: Burning of fuel piles under conditions when the threat of fire spreading from the pile location would be low. Piles would be lit by hand using drip torches. Pile construction specifications would ensure that pile burning would result in minimal damage to residual trees in the stand.

LOP AND SCATTER: In areas where non-merchantable tops and limbs would be left, boles would be cut to less than six feet in length and limbs would be severed from bole and scattered to prevent fuel bed depth from exceeding two feet in depth.

LANDSCAPE PRESCRIBED FIRE:

Landscape prescribed fire would be applied across approximately 1,530 acres within Upper Touchet planning area. Fire intensities would be kept low across the majority of burn units by establishing backing fires to minimize fire in the canopy, and burning mainly surface and ladder fuels throughout the majority of the prescribed fire area. Individual tree and group torching would likely occur in areas where there are sufficient ladder fuels, and in timber stands where there are high occurrences of mistletoe infected trees. Hand fireline and blackline would be utilized along burn area and burn block perimeters to control or stop the progression of fire. Blacklining methods would be completed by hand (manual

methods) and in some areas by aerial ignition methods. Aerial and hand ignition would be utilized to ignite and establish backing fires in prescribed fire areas and burn block interiors.

DANGER/HAZARD TREE REMOVAL

Danger or hazard trees would be felled and removed along all haul routes used for timber sale activity, as well as around trailheads, groomed ski runs, ski area facilities, and communication equipment sites. Trees with an imminent failure potential and those deemed likely to fail within a 5-10 year period would be felled along open system roads. Only danger trees with an imminent failure potential would be felled on closed system roads. (See "Danger Trees" in the Glossary for definitions of "imminent failure" and "likely to fail").

Along open system roadways and groomed ski runs within the project area, trees would be evaluated in accordance with the Field Guide for Danger Tree Identification and Response, Pacific Northwest Region, 2008. Trees in and around a known human or facility "target" (e.g. trailheads, ski lift corridors, ski area buildings, communication facilities) would be evaluated in the context of Long Range Planning for Developed Sites in the Pacific Northwest: The Context of Hazard Tree Management, Pacific Northwest Region, 1992. If considered economically feasible, danger trees would be sold as part of a timber sale. Danger trees within Riparian Habitat Conservation Areas (RHCAs) would be felled and left to provide additional coarse woody debris.

If considered economically feasible, danger trees would be sold as part of a timber sale.

ROAD MANAGEMENT

To accomplish proposed activities, approximately 24 miles of open system roads and 9 miles of closed system roads (operational maintenance level 1), would be used as haul routes on NFS lands. Closed system roads used for project activities would not be opened to the public during project activities. All system roads would remain the same after project implementation; closed roads would continue to be closed, and open roads would continue with preexisting designations.

MATERIAL SOURCES: There are two existing material sources that would be utilized for this proposed action. One material source is located at Chase Mountain on the 6437 road and the other at Griffin Peak on the 6436 road (legal description?).

ROAD MAINTENANCE: Road maintenance may be needed to make roads accessible and safe for use during project implementation, and to protect water quality and aquatic resources. Road maintenance may consist of a variety of activities including surface rock replacement, spot surfacing, roadside brushing, erosion control, logging out, road surface blading, ditch cleanout, slide removal, dust abatement, culvert cleaning or replacement, danger tree removal (see below), and other items that contribute to the preservation of the existing road and its safe use.

TEMPORARY ROADS: Construction of temporary road spurs would be needed to access multiple units which are not directly adjacent to open or closed (Forest system) roads. Temporary roads fall under two categories: newly constructed temporary roads or temporary roads that will be constructed using an existing template, such as a decommissioned road (a road previously removed from the Forest

system), old skid trails, or unauthorized routes. Temporary roads would be obliterated after project implementation (Forest Plan p. 4-85).

CLOSED ROADS RE-OPENED FOR HAUL WITH RECONSTRUCTION: Forest system roads that are identified as closed, or in storage status (Maintenance Level 1) would be needed to access units. These roads would be temporarily re-opened for use during implementation. Actions needed to re-open these roads may include blading, installation of drainage features or culverts, hardening of soft spots, and brushing. These roads would be restored and returned to closed status after project implementation.

2.1.2 Treatment Phases (WHEN part of Proposed Action

Project activities may be implemented in phases over a period of approximately 1-20 years. The phases represent the Ranger District's best approximation for project implementation. Phases may be combined or treatments applied in a different order of monitoring or experience indicates that such a change would be beneficial to meeting project objectives.

2.2 Alternative B –No Temporary Roads

Alternative B was developed in response to comments received during scoping expressing a desire to maintain existing soil characteristics and slope profiles rather than temporarily convert forest ground surfaces to road prisms. Activity units included in Alternative A requiring temporary road access, as well as the proposed temporary roads themselves, were removed to create Alternative B (Table X)

Treatments are the same as Alternative A, except that more helicopter logging would be used to access and remove material. Approximately 7 miles of existing roads would be used for log hauling.

Tree cutting activity is proposed on the same 1,590 acres, and prescribed fire on the same 1,530 acres (Table X). There would be less need for hazard tree removal because fewer roads would be involved. Fuel treatments …

2.2.1 Treatment Descriptions – if same as above – just state that

Treatments fall under the treatment description identified in Alternative A

2.2.2 Treatment Phases

2.3 Alternative D – Modified Proposed Action

Alternative D was developed in response to comments that larger trees (> 21 inches DBH) should be removed to better meet stand objectives. This alternative proposes cutting grand fir trees up to 30 inches DBH where necessary to achieve desired outcomes.

In addition, some units proposed in Alternative A were dropped from consideration in Alternative D to reduce impacts to wildlife movement and habitat connectivity.

Some units with a commercial thin planned under Alternative A shifted to an improvement cut planned under Alternative D to remove some large trees of less-desired species (predominantly grand fir) or tree quality (unhealthy, low-vigor crowns).

X units were added … check notes for reasoning

-

2.3.1 Treatment Descriptions

Same as Alternative A, except for acre differences noted in Table 1.

2.3.2 Treatment Phases

See Alternative A for discussion

2.4 Alternatives Considered and Dismissed

2.4.1 Alternative C – Construction of No Temporary Roads or Cutting of Trees in Moist Forest

Several public comments described a desire to avoid tree-cutting activities in moist forest. This option was evaluated and dismissed from detailed environmental effects analysis because it eliminated x% of the proposed activities, and therefore did not meet the purpose and need for the project.

The deciding official determined that it is unlikely that the scope and scale of the activities within Alternative C would have much of an effect on conditions within the project area or meaningfully contribute toward achieving the project purpose and need.

Landscape burning was excluded because without harvest in moist forest, it would not be safe for firefighters to hold the burn unit boundary without pre-treatment of fuels within moist forest environments.

2.5 Alternatives Summary

Three action alternatives (A, B, and D) were analyzed in this EA. Alternative A is nearly identical to the proposed action presented for scoping, and Alternatives B and D were developed to meet the Project purpose and need while addressing public comments. Alternative D is only 55 additional acres of tree cutting than the other alternatives (Table X) but may yield more volume??

TABLE 1 COMPARISON OF ACTIVITIES BY ALTERNATIVE

Activity	Alternative		
Silvicultural and Fuels Activities (Acres)	A	B	D
Commercial thinning and improvement cutting	1150	1150	1205
Non-commercial thinning	440	440	360

Landscape prescribed fire	1530	1530	1530
Logging Systems (Acres) *			
Skyline	800	560	830
Helicopter	170	390	75
Ground-based equipment	180	200	300
Transportation and Access (Miles)			
Maintenance Level 1 roads used for haul	9.2	7.5	8.1
Maintenance Level 2 roads used for haul	4.0	4.0	4.6
Maintenance Level 3-4 roads used for haul	19.8	19.8	24.0
Maintenance Level 5 roads used for haul	7.6	7.6	7.6
Newly constructed temporary roads	1.05	0	1.00
Temporary roads constructed on existing template	.24	0	3.7
John to add a line			
Total project road miles	42	39	49
Economics			

Insert simple Table of findings from Chapter 3 conclusions sections:

Resource	Alt A	Alt B	Alt D	Significance?
Vegetation/Fuels				
Air quality				
Recreation				
View- shed /Visuals				
WUI				
Wildlife				
Roads				
Invasive Plants				
Soils				
Hydrology				
Fish				
Economics				
Heritage				
Botany				

2.6 Design Elements and Mitigation Measures to Ensure Environmental Protection

This section describes design elements and mitigation measures to ensure environmental protection from implementation of the Proposed Project. These proactive measures are taken to avoid, minimize, or reduce potential impacts to valued resources from implementing the project. They include best management practices (BMPs), Forest Plan standards and guidelines, project design features, and monitoring and are intended to further limit the magnitude, extent, speed, and duration of any effects that are deemed unavoidable. These measures address applicable laws, regulations, policies, and Executive Orders, as well as other issues identified by the Interdisciplinary Team or brought forth during scoping, including some measures that may be required to ensure consistency with the current Forest Plan (1990) and planned revision to the Forest Plan, in progress at present. These measures may be modified or changed, or new measures may be added in response to public comments and the environmental analyses process based on review of the draft EA.

TABLE 2 DESIGN CRITERIA AND MITIGATION MEASURES

Resource	#	Mitigation Measure(s) / Design Elements
Recreation	1	
	2	
	3	
	4	
	5	
Fuels (WUI)		
Air Quality		
Fuels (Rx) Examples		Prescribed burn plans will be developed according to agency standards and approved prior to initiating any burning operation. Activities will incorporate prescription elements into the prescribed fire plan including such factors as weather, slope, aspect, soils, fuel type and amount, and fuel moisture in order to minimize adverse impacts to soils.
		Prescribed burns will be implemented and tactically executed to protect identified values at risk and hold fire spread within the identified project area.
		All burning would be coordinated daily with the WWA Department of Environmental Quality (WADOE). Burning would not take place on any portion of the project without prior approval from WADOE - correct to Oregon
		Prescribed fire would only be implemented between October 1 and March 31 to avoid

		disturbing lesser long-nosed bat populations in the area.
		Piles generated from thinning will be constructed in locations without an overstory canopy to mitigate damage to larger trees' crowns.
		No permanent or temporary road construction would be allowed for the purpose of burning. Any off-road vehicle trails resulting from proposed activities would be obliterated and restored. Established Forest System roads will be utilized for access to the treatment units. Off-road vehicle activity during fire activities would be kept to a minimum.
Vegetation	1	
	2	
	3	
Socio-Economics	1	
	2	
	3	
Roads	1	
	2	
	3	
Soils	1	Retain as much duff as possible, while meeting fuel reduction objectives to control erosion and provide organic matter.
	2	For jackpot or underburning, maintain 20 percent or less soil exposure on slopes greater than 35%.
	3	Fireline construction placement only occur where necessary. Fireline construction to meet minimal standards for prescribed burning. Locations will be evaluated post-harvest. All firelines to be water barred and seeded after project completion, as needed.
	4	Yarding spacing for optimum efficiency and minimum soil disturbance. Forwarder trails will average 50 feet apart, except where converging. Skid trail spacing will average 100 feet. All trails require approval prior to use.
	5	Utilize low ground pressure equipment and existing trail system and landings as much as possible. To limit detrimental soil disturbance within commercial harvest units, low ground pressure equipment (less than 8.5 pounds per square inch [psi]) can be allowed off trails on dry, snow-covered, or frozen soil; no other heavy equipment will leave roads or trails.
	6	Ground based equipment will operate when soil conditions are dry, frozen, or snow covered enough to support machinery adequately. Use of harvest or mastication equipment will not be permitted when soils reach field capacity for moisture, to limit the potential of long-term detrimental soil disturbance.
	7	To minimize detrimental soil conditions, forwarders will need to ride on a slash mat with a minimum depth of 12 inches, if that much slash is available. If that much slash is not available, operations must occur after the soil is obviously dry (based on appearance and feel, 2 to 6 inch depth), and must make the slash mat as deep as feasible.
	8	Retain sufficient slash/biomass material to provide organic matter and nutrients commensurate with existing technical recommendations.
	9	Ground-based equipment will not operate on sustained slopes greater than 35% in order

<table>
<tr><td></td><td></td><td>to reduce the potential for soil displacement, erosion, and compaction (Forest Plan). Within the Ski Bluewood Special Use Permit boundary, ground-based equipment will not operate on sustained slopes greater than 45% (FSM 2521.03.3), as approved by the soil scientist. Directional felling or winching shall be used where necessary.</td></tr>
<tr><td></td><td>10</td><td>Avoid uphill skidding or forwarding for more than 50 feet on slopes steeper than 35 percent.</td></tr>
<tr><td></td><td>11</td><td>In the non-commercial thinning units, mechanical thinning equipment may be used provided that equipment that exceeds 7 PSI is not allowed to travel over the same path more than once.</td></tr>
<tr><td></td><td>12</td><td>Maximum spacing for water-bars on temporary roads, skid trails and mechanical firelines are shown in the table below. Water-bars are to be cut at an angle of 30-40 degrees and depth of 12-18”
<table>
<tr><th>Gradient</th><th>Spacing</th></tr>
<tr><td>< 5 %</td><td>200 ft</td></tr>
<tr><td>5-10 %</td><td>150 ft</td></tr>
<tr><td>10-20 %</td><td>100 ft</td></tr>
<tr><td>21–40 %</td><td>50 ft</td></tr>
<tr><td>> 40%</td><td>25 ft</td></tr>
</table></td></tr>
<tr><td></td><td>13</td><td>Minimize exposure of soils and keep erosion control current.</td></tr>
<tr><td></td><td>14</td><td>Landings will be designed and constructed to minimize size and provide for safe operations.</td></tr>
<tr><td></td><td>15</td><td>Erosion control measures will occur on all skid trails and landings, as specified under timber sale contract provisions B (T) 6.67 and C (T) 6.6#. Seed soil exposed by contract operations using native seed. Subsoil, waterbar, and mulch using existing slash as necessary to prevent erosion.</td></tr>
<tr><td></td><td>16</td><td>Placement of new temporary roads will be on deep soils, if it is operationally feasible. This will allow for adequate restoration of temporary roads and over time will leave less detrimental soil condition on the proposed activity units.</td></tr>
<tr><td></td><td>17</td><td>Temporary roads will be inspected to verify that erosion and stormwater controls are implemented and functioning and are appropriately maintained.</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>RHCA</td><td>1</td><td>Stream and riparian protection is based on the Forest Plan as amended by PACFISH. PACFISH standards and guidelines related to timber harvest, roads, and fire apply to this project and are incorporated by reference into this document. No harvest, landings, noncommercial thinning or slash piling will take place in RHCAs which are described below as they apply to this project.
Category 1 - Fish-bearing streams: RHCAs consist of the stream and the area on either side of the stream extending 300 feet slope distance from the edges of the active stream channel.
Category 2 - Perennial non-fish-bearing streams: RHCAs consist of the stream and the area on either side of the stream extending 150 feet slope distance from the edges of the active stream channel.
Category 3 - Ponds, lakes, reservoirs, and wetlands greater than 1 acre: RHCAs consist of the body of water or wetland and the area to the outer edges of the riparian vegetation, or the extent of the seasonally saturated soil, or 150 feet slope distance from the edge of</td></tr>
</table>

		the maximum pool elevation of constructed ponds and reservoirs or from the edge of the wetland, pond or lake, whichever is greatest. **Category 4 - Seasonally flowing or intermittent streams, wetlands less than 1 acre, landslides, and landslide-prone areas:** This category includes criteria with high variability in size and site-specific characteristics. At a minimum the RHCAs must include: the area from the edges of the stream channel, wetland, landslide, or land-slide prone area to a distance equal to 100 feet.
	2	PACFISH Standards are listed on pages C10-C18 https://archive.org/details/decisionnoticede23unit/page/n151 The following standards apply to this project: TM-1, RF-1, RF-2, RF-3, RF-4, RM-1, RM-2, FM-1, FM-4, FM-5, RA-2, RA-4, RA-5
	3	Prescribed Fire will not be ignited in RHCAs but will be allowed to back into RHCAs
Water Quality	1	As referenced under timber sale contract standard provisions B(T)6.5 "Stream course Protection and B(T)6.6 "Erosion Prevention and Control", commercial use of National Forest roads shall be suspended when commercial contract or permit operations create movement of sediment laden water from the road surface in areas where it could flow into stream channels. This may be from pumping of saturated fines by passage of commercial or contract vehicles, creating sediment laden water on the road surface during rain or snowmelt periods.
	2	Timber sale purchaser will prepare a spill containment plan that will ensure that spilled fuel will not leave the site. Fuel will not be stored within any RHCA. Refueling, repair, and maintenance of equipment will be done at landings or on forest roads outside of RHCAs.
	3	Where the proposed haul routes encounter wet areas (e.g. streams, springs, seeps, wetlands) new drainage structures and surface rock will be installed to prevent rutting and sedimentation.
	4	Proposed temporary roads will have drainage installed if retained over-winter. Upon completion of project activity, roads will be subsoiled if required. Berms will be pulled into the roadbed and re-contoured, and the road will be revegetated with native seed and mulched with existing slash. Road entrances may be camouflaged to discourage use.
	5	During road maintenance and snow plowing side casting of materials will not occur where these materials could be directly or indirectly introduced into a stream, or where the placement of these materials could contribute to the destabilization of the slope.
	6	Slough and waste materials removed during road maintenance activities, including ditch and culvert cleaning, will be deposited in approved disposal areas outside of RHCAs. For erosion control and stabilization the disposal site will be seeded with native species.
	7	Ditches will only be maintained where the water captured by the ditch is not able to be transported to the adjacent drainage structure that carries the water across the road.
	8	The following design criteria will be used for road decommissioning: a) Where decommissioning crosses draws or channels, work will be done when channels are dry. b) Draws will be contoured to match upstream and downstream channel features including: gradient, streambank width and channel cross-sectional area, and floodplain, if present. c) Re-contoured draws will be seeded with local, weed free native seed and mulched with on-site material or weed free straw or hay. d) Roadbeds will be de-compacted and drained as necessary to prevent erosion.

		e) Where full re-contour does not occur, remaining fill will be stabilized. f) Where re-contouring occurs reconnect the surface of the cut bank slope with the re-contoured fill slope
	9	Ephemeral Streams: a) Harvest systems will be designed to minimize crossing ephemeral draws. b) Ground based equipment will only cross ephemeral draws and channels at sites pre-approved by the responsible Forest official, and crossings will be minimized. c) Ephemeral draws will not be crossed where equipment will cause bank breakdown. Woody debris or rock may be placed into crossings to reduce soil disturbance and compaction. d) Ephemeral stream channels will not be used as forwarder trails, landing sites, or as road locations. e) All embedded wood will be retained. Other wood will be retained as specified in project design criteria for Wildlife.
Fish Biology		
Wildlife		Protect known or discovered raptor nest sites from management and human disturbances until fledging has been completed. Level of protection will vary by species and will be recommended by the District wildlife biologist.
		Unique wildlife habitat such as, seeps, springs, bogs, wallows, cliffs, talus, and caves will be protected by minimizing ground disturbance one and one half tree lengths from the area. Lithosol (scab flats) and meadows are unique wildlife habitat and will not be used for landings and skid trails unless no other location is practical.
		Outside of the ski area units, all dead trees and snags greater than or equal to 12 inches dbh will remain unless they are a hazard to workers. Snags over 20 inches dbh will be avoided to prevent hazard situations. Any large snags felled for safety reasons will remain on site as down wood unless an excessive amount of fuels exist. Within ski area units (list), all snags will be removed for the protection of the public??? U
		In all units green trees will be retained at the levels in the table below to provide for future

<table>
<tr><td></td><td></td><td>snag recruitment to meet Forest Plan standards.
Minimum green tree snag replacements and down wood retention per acre.
<table>
<tr><th></th><th>Ponderosa pine</th><th>Mixed conifer</th><th>Grand fir</th><th>Lodgepole pine</th><th>Subalpine zone</th></tr>
<tr><td>Green Tree Replacements</td><td>16</td><td>16</td><td>9</td><td>14</td><td>19</td></tr>
<tr><td>Down Wood Pieces</td><td>3 – 6</td><td colspan="2">15 – 20</td><td colspan="2">15 – 20</td></tr>
<tr><td>Diameter at the small end</td><td>> 12 in</td><td colspan="2">> 12 in</td><td colspan="2">> 8 in</td></tr>
<tr><td>Length per piece</td><td>> 6 feet</td><td colspan="2">> 6 feet</td><td colspan="2">> 8 feet</td></tr>
<tr><td>Total length per acre</td><td>> 20 feet</td><td colspan="2">> 100 feet</td><td colspan="2">> 120 feet</td></tr>
</table></td></tr>
<tr><td>Invasive Species</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Heritage/ Cultural Resources</td><td>1</td><td>Prior to implementation of any treatments, the treatment area (units) will be cleared through Section 106 of the National Historic Preservation Act via consultation with and concurrence from the State Historic Preservation Office (SHPO)</td></tr>
<tr><td></td><td>2</td><td>Prior to implementation of any treatments , District personnel will consult with zoned heritage staff regarding protective measures for any significant sites (in heritage regulatory terms)</td></tr>
<tr><td></td><td>3</td><td>No tracked or pneumatic tired vehicles will be allowed in significant sites</td></tr>
<tr><td></td><td>4</td><td>Prescribed burning may be allowed after consultation with Zone Heritage staff</td></tr>
<tr><td></td><td>5</td><td>The Zoned Heritage staff will re-examine sites of cultural significance following prescribed burning activities and report results back to the SHPO</td></tr>
<tr><td></td><td>6</td><td>Mitigation involves avoidance and since there are no anticipated impacts, no detailed analyses will be undertaken</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Botany		

CHAPTER 3 ENVIRONMENTAL IMPACTS

3.1 Introduction

The Code of Federal Regulations (40 CFR 1508.9) states the EA shall briefly provide sufficient evidence and analysis, including the environmental impacts of the proposed action and alternative(s), to determine whether to prepare either an EIS or a finding of no significant impact (FONSI). The purpose of an EA is not only to disclose impacts, but to evaluate those impacts in the context of NEPA significance (40 CFR 1508.27). Resources that, through initial analysis, were not impacted or that impacts were so limited due to the implementation of design elements / mitigation / standards and guides, and therefore not further analyzed, include Botany and Heritage.

This chapter summarizes the cause and effect relationships of implementing each alternative considering, in detail, the social, physical, and/or biological characteristics of the area potentially affected by the alternatives being analyzed. Resource specialists analyzed the magnitude of direct, indirect, and cumulative effects of the proposed activities on both short and long-term productivity. Only information necessary to understand the environmental consequences was included in the EA. The project record contains all project-specific information relevant to decision-making and is located at the Walla Walla Ranger District Office.

Terms and definitions used in discussing the environmental impacts of proposed activities are described as follows:

Affected environment (40 CFR 1502.15) is a brief description of the area(s) potentially affected by the proposed activities. Resource-specific descriptions of the affected environment are included within each resource section only when that description helps to frame the analysis of effects.

Direct impacts (40 CFR 1508.8) are those occurring at the same time and place as the triggering action (e.g. soil erosion during construction on site). They are looked in terms of context (setting) and intensity (magnitude, duration, extent, likelihood, and speed)

Indirect impacts (40 CFR 1508.8) are those caused by the action, but occurring later, or at a distance from the triggering action (e.g. soil erosion leads to sedimentation of the river which can cause adverse health effects to aquatic predators downstream of the site). They are looked in terms of context (setting) and intensity (magnitude, duration, extent, likelihood, and speed)

Cumulative impacts (40 CFR 1508.7) are the effects that result from incremental effect of the action when added to the effects of other past, present, and reasonably foreseeable future actions, regardless of who takes the action and regardless of land ownership on which other actions occur (e.g. sedimentation from this project in addition to that from other projects on private land occurring in the same watershed would be cumulative). An individual action, when considered alone, may not have a significant effect, but when its effects are considered in addition to effects of other past, present, and reasonably foreseeable future actions, the total

effect may be significant. The cumulative effects analysis for each alternative is evaluated separately for each resource and may have different spatial/temporal boundaries. Agencies are not required to list or analyze the effects of individual past actions unless such information is necessary to describe the cumulative effects of all past actions combined. The analysis of cumulative effects begins with consideration of the direct and indirect effects that are likely to occur from the alternatives analyzed in the current project. Agencies then look for present effects of past actions and potential effects of known future actions that are, in the judgment of the agency, relevant and useful because they may interact with the direct and indirect effects of the current project.

3.2 Impacts

3.2.1 Vegetation

3.2.1.1 Affected Environment

3.2.1.2 Relevant Laws, Regulations, Policies, Guidance, and Plans for Silviculture

3.2.1.3 Methodology

3.2.1.4 Impacts Analyses by resource

ALTERNATIVE A – PROPOSED ACTION ALTERNATIVE

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

ALTERNATIVE B – NAME OF ALTERNATIVE B

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

ALTERNATIVE D – NAME OF ALTERNATIVE D

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

3.2.2 Fuels

3.2.2.1 Affected Environment

3.2.2.2 Relevant Laws, Regulations, Policies, Guidance, and Plans for Silviculture

3.2.2.3 Methodology

3.2.2.4 Impacts Analyses by resource

ALTERNATIVE A – PROPOSED ACTION ALTERNATIVE

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

ALTERNATIVE B – NAME OF ALTERNATIVE B

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

ALTERNATIVE D – NAME OF ALTERNATIVE D

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

3.2.3 Recreation

3.2.3.1 Affected Environment

3.2.3.2 Relevant Laws, Regulations, Policies, Guidance, and Plans for Silviculture

3.2.3.3 Methodology

3.2.3.4 Impacts Analyses by resource

ALTERNATIVE A – PROPOSED ACTION ALTERNATIVE

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

ALTERNATIVE B – NAME OF ALTERNATIVE B

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

ALTERNATIVE D – NAME OF ALTERNATIVE D

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

3.2.4 Wildlife

3.2.4.1 Affected Environment

3.2.4.2 Relevant Laws, Regulations, Policies, Guidance, and Plans for Silviculture

3.2.4.3 Methodology

3.2.4.4 Impacts Analyses by resource

ALTERNATIVE A – PROPOSED ACTION ALTERNATIVE

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

ALTERNATIVE B – NAME OF ALTERNATIVE B

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

ALTERNATIVE D – NAME OF ALTERNATIVE D

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

3.2.5 Transportation Systems (Roads)

3.2.5.1 Affected Environment

3.2.5.2 Relevant Laws, Regulations, Policies, Guidance, and Plans for Silviculture

3.2.5.3 Methodology

3.2.5.4 Impacts Analyses by resource

ALTERNATIVE A – PROPOSED ACTION ALTERNATIVE

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

ALTERNATIVE B – NAME OF ALTERNATIVE B

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

ALTERNATIVE D – NAME OF ALTERNATIVE D

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

3.2.6 Soils

3.2.6.1 Affected Environment

3.2.6.2 Relevant Laws, Regulations, Policies, Guidance, and Plans for Silviculture

3.2.6.3 Methodology

3.2.6.4 Impacts Analyses by resource

ALTERNATIVE A – PROPOSED ACTION ALTERNATIVE

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

ALTERNATIVE B – NAME OF ALTERNATIVE B

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

ALTERNATIVE D – NAME OF ALTERNATIVE D

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

3.2.7 Hydrology

3.2.7.1 Affected Environment

The Upper Touchet analysis area is located in the Tollgate Plateau, Blue Mountains physiographic province of southeastern Washington which are comprised of uplifted Columbia River Basalts plateaus, steep V-shaped canyons, and narrow valley bottoms. Elevation ranges from 2700 feet near the confluence of Lewis Creek to 5600 feet at the divide above Ski Bluewood. Maritime influence is strong through the Columbia River Gorge and precipitation is highest in the Blue Mountains, with 57 inches of precipitation at Chase Mountain Snotel site, dropping to 36-40 inches at the base of the subwatershed at the FS boundary.

The Upper Touchet project boundary contains about 4,453 acres of NFS lands located in portions of five subwatersheds (Figure 1 and Table 1). Figure 1 shows the majority of the project occurs in the Upper North Fork Touchet SWS.

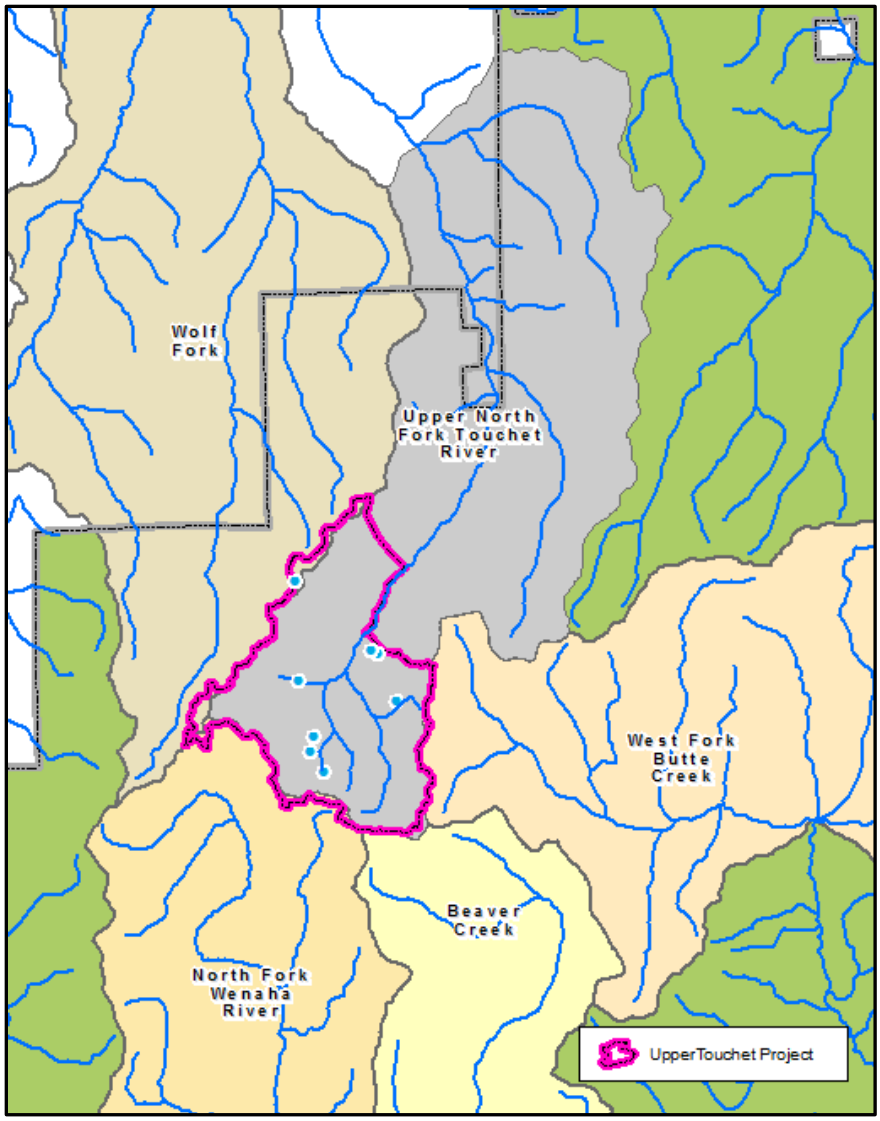


Figure 1. Subwatersheds of the Upper Touchet Project Area

Table 1: Subwatersheds within the Upper Touchet Analysis Area

Subwatershed (HUC12)	SWS Name	SWS acres	NFS acres in SWS	Project Acres in SWS	% Project Area in SWS-FS
170701020301	Upper North Fork Touchet River	17,805	15,583	4,087	26%
170701020301	Wolf Fork	26,757	6,765	219	3%
170601060303	North Fork Wenaha River	17,586	17,586	131	0.7%
170601060304	Beaver Creek	12,485	12,485	51	0.4%
170601060306	West Fork Butte Creek	16,822	16,822	11	< 0.1%

The project area is drained by the North Fork Touchet River, which flows north towards the town of Dayton, WA. Several springs and seeps occur, predominantly in headwater areas. Most precipitation occurs as snowfall between December and April, with peak streamflows occurring in April during snowmelt runoff (Figures 2 and 3).

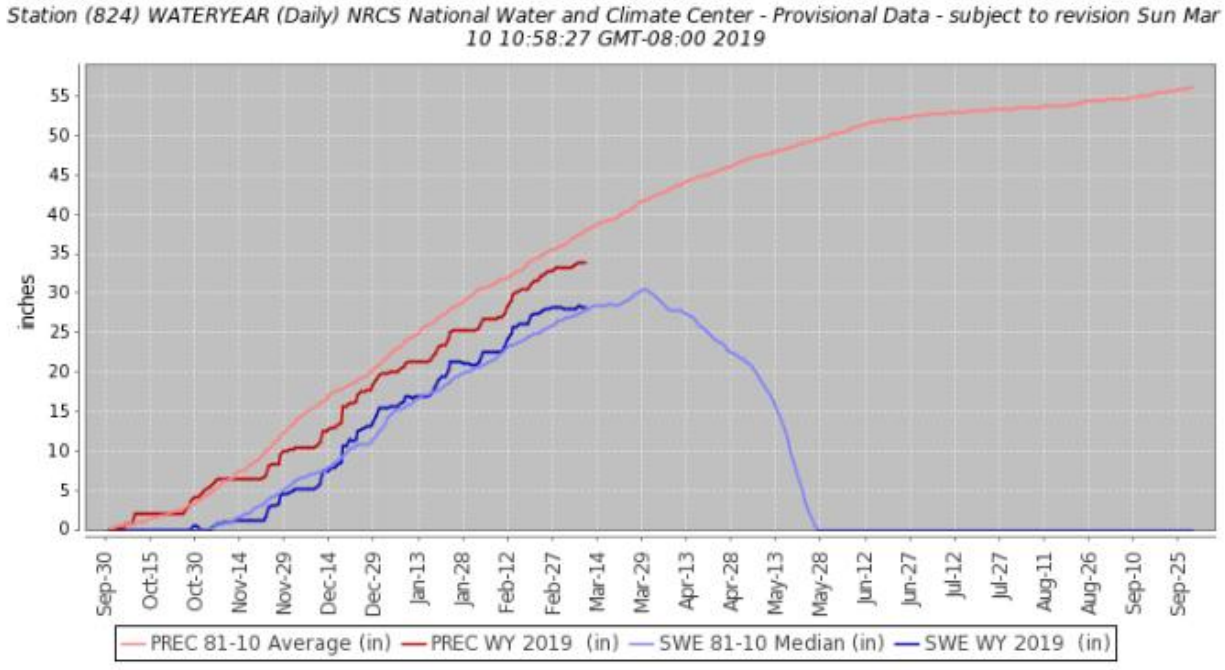


Figure 2. Touchet SNOTEL site average precipitation and snow water equivalent (SWE)

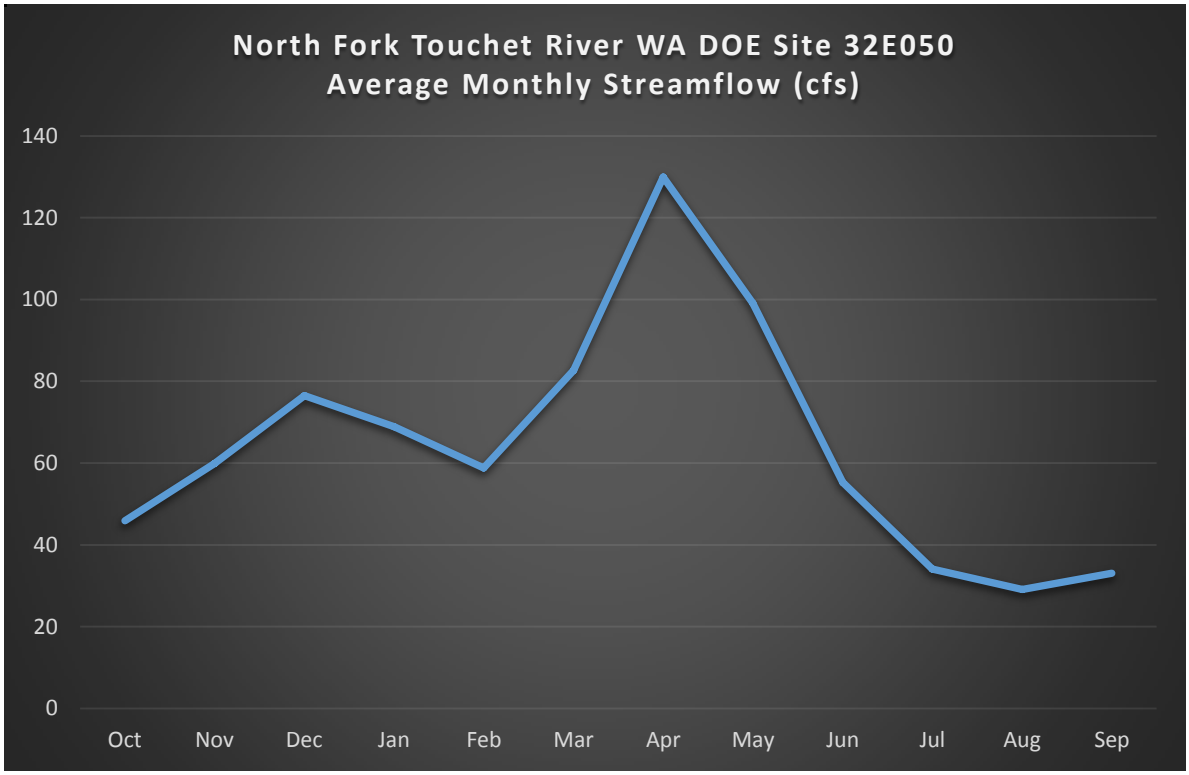


Figure 3. North Fork Touchet River Stream Gauging Station (located 17 miles downstream of project area)

Snow can accumulate throughout the project area but is transient below 3,000 feet, and variable year to year between 3,400 and 4,400 feet, the so-called "rain-on-snow" zone. Above 4,400 feet, snow generally persists through the winter months. As shown on Figure 4, the Upper Touchet Project area occurs at the higher elevations and is therefore less likely to receive winter rainfall that can rapidly melt the snowpack. The landscape downstream of the project area is somewhat prone to runoff during warming trends in the winter months, which can lead to damaging floods. The most recent regional rain-on-snow event, winter 1996, produced streamflows within the project area estimated to be a 30-year flood event (Thinnes 1996) and damaged parts of Forest Road 64. During the past 15-20 years, Forest Road 64 has had many improvements, including upgrading all culverts to allow passage of higher flows and paving the road surface to greatly reduce sedimentation.

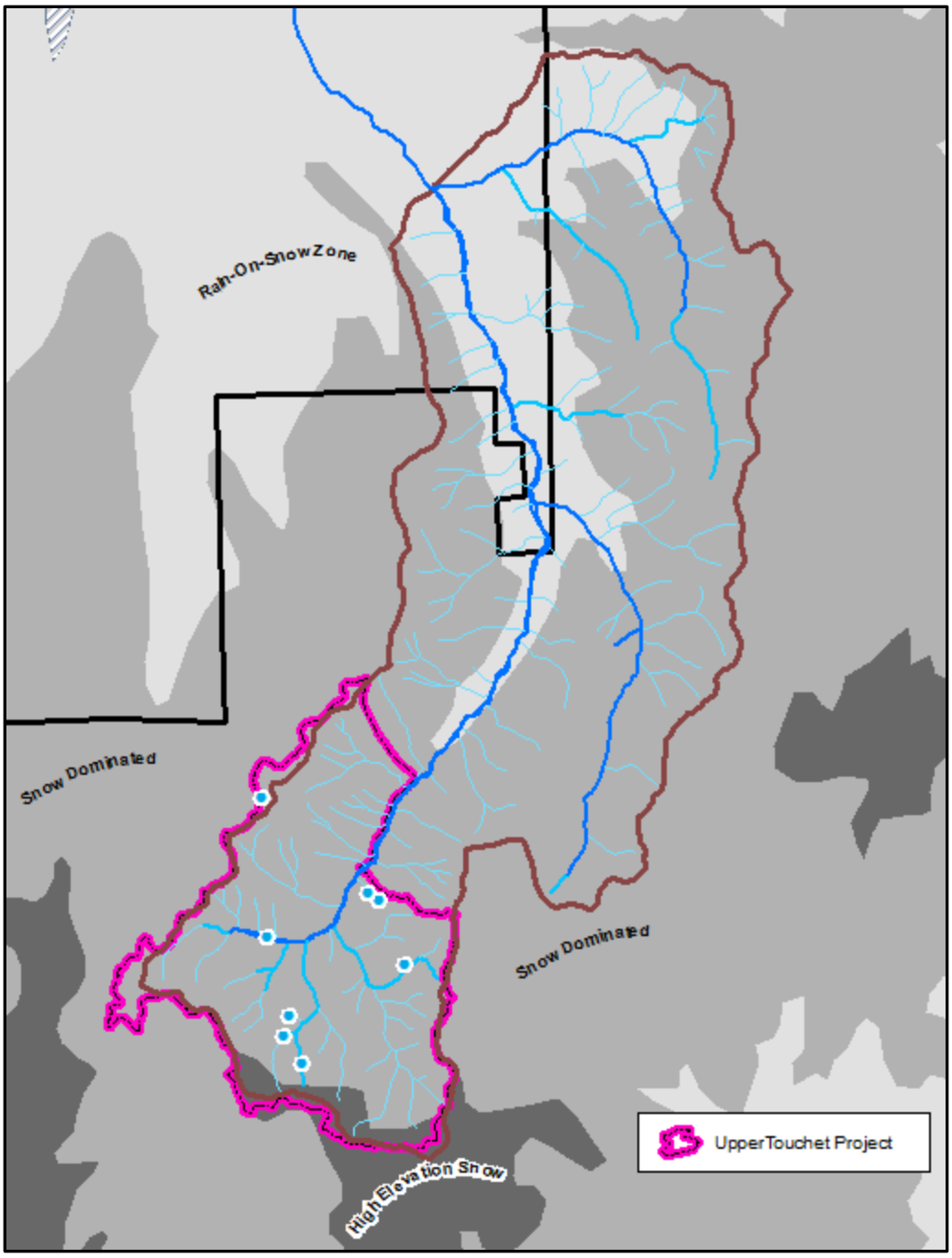


Figure 4. Snow Zones, Upper North Fork Touchet Subwatershed (WA DNR 1991)

The 2006 Columbia Complex Fire burned with variable severity on private lands and NFS lands in the SWS. About 15% (2,300 acres) of the FS portion of the SWS experienced high tree mortality (Figure 5), although areas of high soil burn severity occurred on only about 1,200 acres. Post-fire weather was favorable, and no damaging runoff events occurred on NFS lands in the SWS.

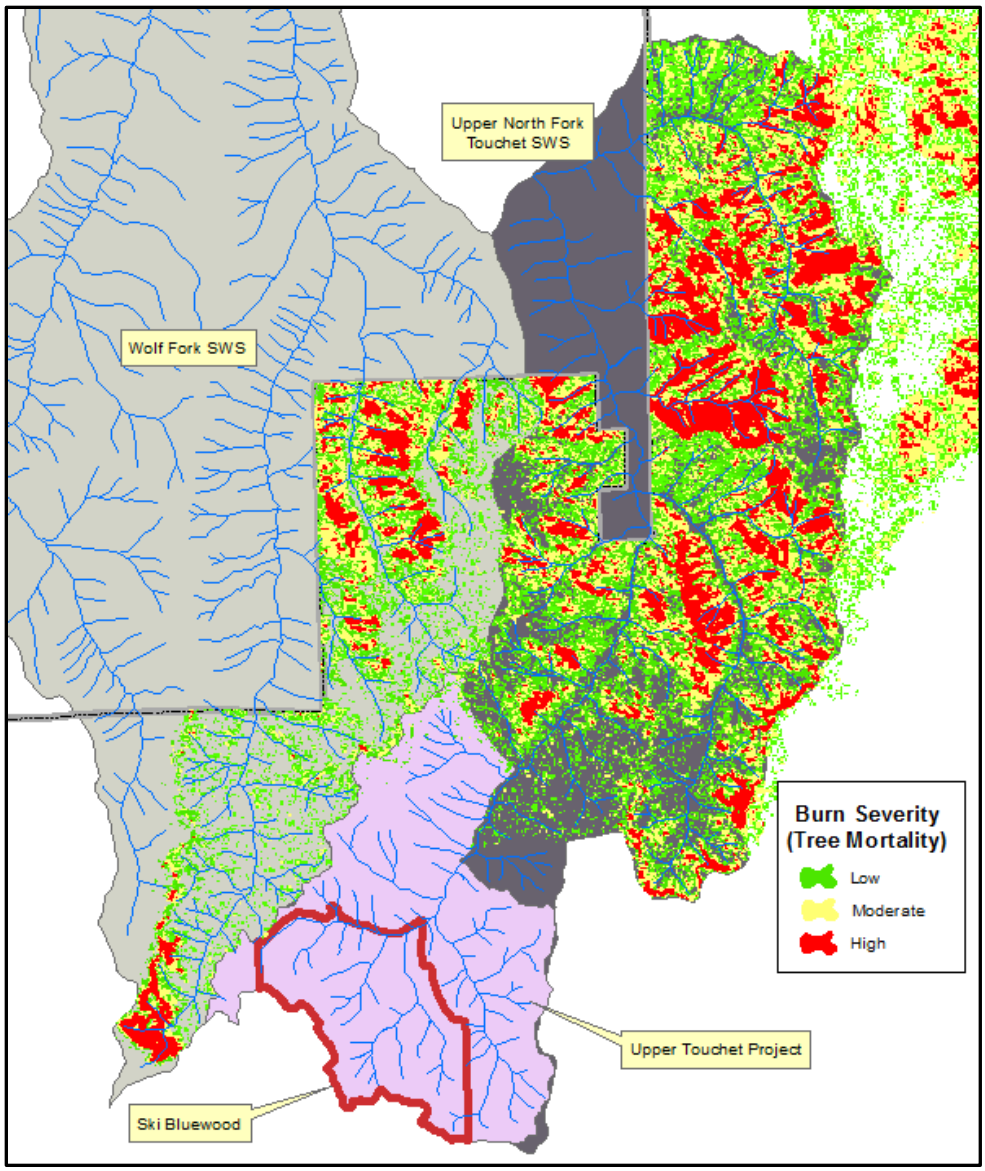


Figure 5. Columbia Complex Fire – 2006, Monitoring Trends in Burn Severity (MTBS)

In 2012, the Upper North Fork Touchet River SWS was identified as a national priority subwatershed in the Watershed Condition Framework (USFS 2011a) and suite of restoration actions were included in the Upper North Fork Touchet Watershed Restoration Action Plan (USDA FS 2012 and 2016). The Northwest Power and Conservation Council Walla Walla Subbasin Plan (WWSP 2004) identifies the North Fork Touchet as a priority for protection and for restoration. It is designated as critical habitat for ESA listed bull trout. Replacement of barrier culverts was identified as a recovery action in the Columbia River Bull Trout Draft Recovery Plan (the Plan has since been finalized, USFWS 2015). The overall restoration goals in the Upper North Fork Touchet River were to restore fish passage by replacing restrictive culverts and to improve water quality, habitat features, and channel stability by reducing sedimentation and disturbance from dispersed and developed recreation facilities. A biological opinion for bull trout was issued in 2004 and projects were implemented from 2005 to 2016.

Ski Bluewood operates within 1437 acres under a Special Use Permit. Maintenance and operation of facilities (including system and nonsystem roads) at Ski Bluewood are the responsibility of the permit holder, as described in the Special Use Permit (USFS 2011b).

3.2.7.2 Relevant Laws, Regulations, Policies, Guidance, and Plans for Hydrology

Congress has given the State of Washington the authority to implement the Clean Water Act (33 U.S.C. §1251 et seq. (1972)), requiring water quality standards to protect beneficial uses. It also requires the biennial listing of impaired (303d) streams and the establishment of Total Maximum Daily Loads (TMDL) for pollutants. In association with the TMDL, Water Quality Management Plans (WQMP's) must also be developed. The state of Washington's water quality standards include an anti-degradation policy (Ch. 173-201A-300-WAC), covering human activities impacting surface waters in the state. Under this policy, all land use activities must be designed to have no negative impact on riparian function. A memorandum of agreement between the Forest Service and Washington Department of Ecology (USFS 2018) designates the Forest Service as the agency responsible for implementing the Clean Water Act on National Forest lands. This is accomplished through water quality Best Management Practices (BMP's) that support the goal of meeting or exceeding established water quality standards for habitat, sedimentation, temperature, riparian condition and stream morphology. All management activities on National Forest lands must adhere to standards and guidelines found in the Umatilla National Forest Plan.

3.2.7.3 Methodology

The information for this report was obtained through field reconnaissance, Geographic Information System (GIS), aerial image analysis, stream temperature gauges, computer modeling, and review of past reports, streamflow data (WA DOE website) and SNOTEL data (NRCS website). The National Wetlands Inventory was used in GIS to determine where wetlands have been mapped in the past. Field reconnaissance in the Upper Touchet planning area was done prior to implementation, and an effort was made to accurately map streams and other riparian-wetland areas. Not every stream or potential wetland area was visited and/or documented. Unmapped riparian-wetland features requiring PACFISH buffers would be identified in the field by the timber layout crew. GIS and on-the-ground inspection of roads, combined with modeling in the WEPP Roads (Elliot et al 1999a and 1999b) module for sedimentation potential provided the basis for the aquatic risk of roads assessment. Hillslope erosion due to proposed actions was modelled using the disturbed WEPP module. Peak flow analysis was done using the Equivalent Clearcut Area (ECA) model (Ager and Clifton 2005). Cumulative effects analysis for water quality in this project area were analyzed at the stream reach scale, assessing past, present and reasonably foreseeable impacts to sedimentation and temperature.

SCALE OF ANALYSIS

The hydrologic system and the hydrologic effects of proposed actions will be analyzed for National Forest System (NFS) lands by the 12 digit Hydrologic Unit Code (HUC), also known as a subwatershed (SWS). HUC is a hierarchical national level interagency map of the hydrologic system. Cumulative effect indicators including ECA are reported by HUC12. Effects to water quality are based on the stream reaches identified by Washington Department of Ecology (WDOE). WDOE designates beneficial uses of water resources and establishes water quality standards protective of those uses.

The Upper Touchet analysis area contains about 4,453 acres of NFS lands located in portions of five subwatersheds (Table 1 and Figure 1). All streams and RHCAs in the Upper Touchet Project area occur in the Upper North Fork Touchet SWS, therefore, unless otherwise stated, all effects for this report will be specific to that subwatershed.

Cumulative effects for water quality will be analyzed for short term 1 day to 1 week and for long term, up to one year (or longer for changes at the landscape scale). These time scales were chosen to display short term concentrated effects, and longer term seasonal effects that are sometimes seen during spring runoff.

Cumulative effects for water yield are calculated using records of timber harvest activity dating to the 1960s. The Equivalent Clearcut Area (ECA) model has a 12-33 year time-frame for hydrologic recovery (collection, storage, and release of precipitation) depending on silvicultural prescription and plant association. Although vegetation management proposed in the project may occur over a number of years, the calculation is done as if all activities occur in 1 year, and therefore shows the maximum effect that could be expected.

RESOURCE INDICATORS AND MEASURES

Treatment alternatives will be evaluated based on their effect to hydrologic function and condition, water quality, and water yield. Indicators used to analyze effects of proposed actions are as follows:

- Hydrologic Function, Floodplains and Wetlands:
  - road density (mi/mi^2)
  - roads in RHCAs (mi)
  - road-stream crossings (number)
- Water Quality:
  - water temperature
  - sediment
- Water Yield:
  - Equivalent Clearcut Area (ECA < 15%)
  - road density (< 3 mi/mi^2)

Hydrologic Function and Condition

MEASURES: ROAD DENSITY, ROADS WITHIN RHCAS AND ROAD-STREAM CROSSINGS

The mapped stream system in the Upper Touchet Project area includes 1.6 miles of perennial streams and 4 miles of intermittent streams. These streams represent the channeled system. The analysis area also contains numerous unchanneled ephemeral draws, with 21 miles mapped in GIS. Surface hydrology was altered during construction of Ski Bluewood when 0.5 miles of perennial stream (Bluewood Creek and Tamarack Run tributary) and 0.35 miles of an intermittent tributary (Country Road tributary) were contained in underground culverts.

Channel condition and riparian vegetation have improved in the past decade due to control of off road vehicles and restricting of some dispersed campsites. Removal or replacement of 5 barrier or partial barrier channel structures during the past decade has improved fish passage and channel function while reducing the risk associated with undersized culverts and fill material within the active channel.

The Umatilla National Forest Plan identifies four stream classes based on flow regime and fisheries resources. The Umatilla NF Land and Resource Management Plan was amended by PACFISH, which identifies four stream categories (Table 2). PACFISH designated default riparian habitat conservation areas (RHCAs) associated with each stream category to provide for management and protection of water quality, habitat features and microclimate.

Table 2: Region 6 Stream Class and PACFISH Stream Category Cross-Walk

	Fish Bearing	Permanently Flowing Non-Fish Bearing	Ponds, lakes, reservoirs and wetlands > 1 acre	Seasonally flowing or intermittent streams, wetlands < 1 acre
R6 Stream Class	I,II	III	N/A	IV
PACFISH Category	1	2	3	4
RHCA Buffer (ft)	300	150	150	100

I = anadromous; II = non-anadromous

Table 3 summarizes stream and RHCA classes within each subwatershed and within the project area in that subwatershed. Note that PACFISH Category 1 and 2 streams can also include non-perennial streams, if they provide habitat during portions of the year.

Table 3: Upper Touchet Project Area Stream Miles (NFS)

	Class I	Class II	Class III	Class IV	Total
Stream Miles					
Project Area	---	1.6	4.0	21.4	27.0
RHCA acres					
Project Area	---	116	145	518	779

The effects of roads on water quality and quantity have been studied for decades. Gucinski et al (2001) and Sosa-Perez (2016) summarized road-related scientific information and the reader is referenced to those documents for more detail. Al-Chokhachy et al (2010) found a negative relationship between the biotic integrity index scores in managed reaches and road density, indicating that the effects of high road densities and the activities associated with forest roads (e.g., timber harvest) can significantly reduce the overall condition of instream physical habitat.

Road density is used as an indicator of potential for affects to hydrologic function (extension of the stream network) and water quality (sediment delivery to surface waters). Stream crossings are used as an indicator of the degree of connectivity between the road system and the drainage network. To the degree that roads are connected to the drainage network the risk of road sediment reaching surface waters is increased, the drainage network is lengthened and the potential for precipitation to drain more quickly, with less residence time in the watershed is increased. Roads have the potential to intercept surface and subsurface water, reducing infiltration and increasing the delivery of water to channels. Roads which are hydrologically connected are a risk to water quality. Sedimentation may be increased by surface erosion from roads and the ability of road drainage to route sediment to channels.

The road system within the project area contains 14.3 miles of open, closed and decommissioned routes and about 3.0 miles of motorized trails. Past road decommissioning in the subwatersheds have reduced road densities and connectivity with channels. Road density within the Upper NF Touchet SWS is low at 1.4 mi/mi^2 and approximately 8 miles of road have been decommissioned within the last twenty years. Full recontour and revegetation of some roads has reduced connectivity with and expansion of the drainage network. Routing of surface runoff and subsurface flow has been moved towards pre-management characteristics and most of the stream-road intersections are ephemeral or intermittent crossings.

Table 4: Road Density and Stream Crossings on NFS Lands in Upper NF Touchet SWS

Scale	NFS (mi^2)	System Roads (mi, open and closed)*	Road Density (mi/mi^2)	Decom-missioned Roads (mi)
Upper NF Touchet SWS	24.3	34.2	1.4	8.3
Project Area	6.4	11.3	1.8	3.0

*includes 1.0 miles of SUP road in Ski Bluewood and 3.0 miles of motorized trail

Measures used to assess effects to RHCAs include road density, roads within RHCAs and road-stream crossings (Table 5). Forest road 64 is the only access road into the area and accounts for most of the roads miles in RHCAs at the project scale. Ski Bluewood has maintenance responsibility of several roads within the SUP area.

Table 5: RHCA Road Interactions

SWS Name	RHCA (mi^2)	NFS Road *Miles w/in RHCAs	RHCA Road Density (mi/mi^2)	Road Miles Decommissioned	Stream- Road Intersections (open roads)
Upper NF Touchet	4.1	9.3	2.3	0.9	73
Project Area	1.2	6.7	5.6	0.6	39

*includes open and closed roads, 1.0 mile of SUP road in Ski Bluewood; 2.0 miles of motorized trail

Forest Road 64 is paved to the Ski Bluewood parking area and the paved road surface is a negligible source of sediment to the NF Touchet River. The sediment transport rate from unpaved road surfaces at stream crossings using the WEPP model (Elliot et al 1999a) calculated that the current road system is adding < 1 ton per year of sediment in the North Fork Touchet River subwatershed. For comparison, the average annual natural background hillslope sedimentation rate measured at the High Ridge Evaluation Area on the Walla Walla Ranger District was 0.03 tons/acre or 19 tons/mi^2 (Helvey and Fowler 1995).

Floodplain Function (Executive Order 11988)

MEASURES: ROAD DENSITY, ROAD-STREAM CROSSINGS AND ROADS WITHIN RHCAS (SEE TABLE 5)

Executive Order 11988 is applicable to those Federal actions which will occur in or which will impact upon flood prone areas. Floodplains or flood prone areas along all streams in the project area are confined, due to the narrow valley in which the streams occur. An unusually large rain-on-snow event during the winter of 1996 caused lateral adjustments along portions of the NF Touchet River. Channel changes due to large flood events are a normal process but can be exacerbated by management actions such as road construction, channel manipulation and other types of development on floodplains and riparian areas, or removal of large woody material and bank stabilizing vegetation. Floodplains within Ski Bluewood permit area were permanently altered along 0.85 miles of stream when these channels were placed into underground culverts (USFS 1973).

Wetlands (Executive Order 11990) and Groundwater Dependent Ecosystems (GDE)

MEASURES: ROADS WITHIN RHCAS AND ROAD-STREAM CROSSINGS (SEE TABLE 5).

Wetlands are those areas that are inundated by surface or ground water with a frequency sufficient to support and that, under normal circumstances, do or would support a prevalence of vegetation or

aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction (FSM 2527). The objective of E.O. 11990 is to avoid to the extent possible, the long and short term adverse impacts associated with the destruction or modification of wetlands and to enhance the natural and beneficial values of wetlands. The analysis area contains two types of wetlands: riverine and slope.

Riverine wetlands occur in floodplains and riparian corridors in association with stream channels. Dominant water sources are overbank flow or subsurface hydraulic connections between the stream channel and wetland areas. Riverine wetlands lose subsurface water by discharge to the channel, movement to deeper groundwater and evapotranspiration. The US Fish and Wildlife Service National Wetlands Inventory (https://www.fws.gov/wetlands/Data/Mapper.html) identifies 269 acres of riverine wetlands in the Upper NF Touchet SWS and 107 acres in the Upper Touchet Project area. The project area contains 8 known seep/spring associated riparian-wetland areas (see Figure 4) and most of these occur as small (< 0.1 acres) features; no seeps or springs have been mapped in other areas within the Upper NF Touchet SWS.

Water Quality

MEASURES: TEMPERATURE AND SEDIMENT

Forest Service responsibilities under the Clean Water Act are defined in a Memorandum of Agreement (MOA) between Washington State Department of Ecology and the Forest Service (USFS 2018). The MOA designates the Forest Service as the management agency responsible for meeting the Clean Water Act on NFS lands and recognizes best management practices (BMPs) as the primary mechanism to control nonpoint source pollution on NFS lands. This means the Forest Service is responsible for defining and implementing appropriate BMPs for National Forest Lands to meet the Clean Water Act.

Beneficial uses for streams in the analysis area have been identified by the State of Washington:

NF Touchet River and tributaries:
Char (bull trout) spawning and rearing
Extraordinary Primary Contact (recreation)
Domestic, Industrial, Agricultural, and Stock water supply uses
(http://apps.leg.wa.gov/WAC/default.aspx?cite=173-201A-602)

Water quality standards are based on life stages of fish and the most restrictive need sets the standard. Water temperature and sediment are the main water quality parameters related to the proposed action (Table 6).

Table 6. Water Quality Standards for Temperature and Sediment

Water Body	Aquatic Life Uses	Temperature	Turbidity
NF Touchet River and tributaries	Char Spawning and Rearing	12°C (53.6°F)	Not to exceed 5 NTU over background **OR** < 10% increase when background > 50 NTU

http://apps.leg.wa.gov/WAC/default.aspx?cite=173-201A-200

The most recent water quality assessment in Washington State was made in 2016:

https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-improvement/Assessment-of-state-waters-303d

Link to Washington State Water Quality Atlas for assessed waters and water quality standards: https://fortress.wa.gov/ecy/waterqualityatlas/map.aspx?CustomMap=y&RT=1&Layers=30&Filters=n,y,n,n&F2.1=0&F2.2=0&BBox=-13131190,5791164,-13109941,5831573

The planning area has no 303(d) listed (water quality impaired) stream segments. The latest assessment identified the NF Touchet River from the Forest boundary to the Touchet Corral Tributary as a water of concern (category 2) for temperature. The TMDL identifies load allocations for perennial streams based on bankfull width and stream orientation (Figure 6) and relies on the Forest Service to implement interim PACFISH buffers and other BMPs needed to protect water quality. The load allocations are expected to result in water temperatures that are equivalent to the temperatures that would occur under natural conditions. Therefore, the load allocations are expected to result in water temperatures that meet the water quality standard. Streams within the analysis area are < 10 m wide, therefore, the TMDL target is at least 80% shade from overstory vegetation.

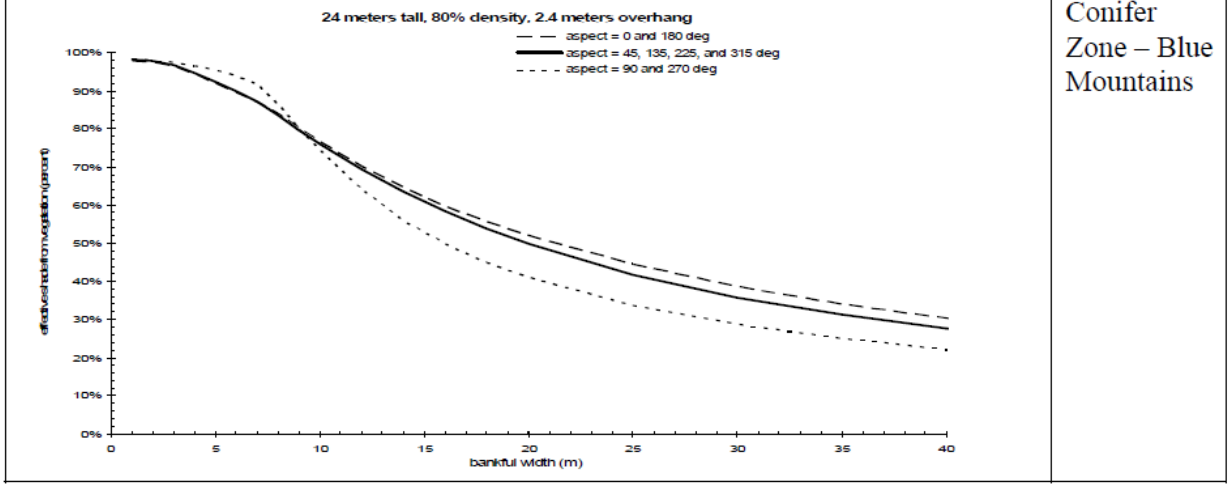


Figure 28. Load allocations for effective shade for various bankfull width and aspect of un-simulated perennial streams in the Walla Walla River watershed.

Figure 6. Walla Walla Temperature TMDL, page 57 (WA DOE 2007)

North Fork Touchet River monitoring near the Forest boundary recorded 7-day average maximum temperatures between 53°F and 59°F during the 1993-2018 monitoring period. There is no apparent trend in 7-DAMT over the course of the monitoring record and no change to 7-day maximum water temperatures was observed as a result of the Columbia Complex Fire.

The goals of the 2004 Bull Trout B.O. and Upper North Fork Touchet WRAP were to restore fish passage by replacing restrictive culverts and to improve water quality, habitat features, and channel stability by reducing sedimentation and disturbance from dispersed and developed recreation facilities. Projects were implemented from 2005 to 2016. A Pacfish/Infish Biological Opinion (PIBO) monitoring site 2.3 miles downstream of the project area showed a 15% increase in the index of physical habitat integrity from 2010 to 2015 (USFS 2004).

Water Yield

MEASURES: ECA (<15%) AND ROAD DENSITY (<3 MI/MI^2)

The relationship between created openings in forested landscapes and changes in water yield and peak flows has been documented by numerous studies. Changes in forested stand and canopy density caused by harvest, fire, or insect and disease can change the distribution of the snow pack, increase the rate of melt of the snow pack, and cause the timing of the melt to be earlier. These factors may lead to changes in peakflows. In addition, reduction of stocking density reduces the overall vegetative use of water, increasing the amount of water available for runoff. Changes in water yield and in peak flows have the potential to destabilize channels, causing increased erosion and sedimentation in channels. Changes in these parameters would be of concern for aquatic habitat and biota, downstream water users, and for channel morphology.

McCammon (1993) describes the relative risk to watershed function of the potential effects on the magnitude and timing of runoff as the result of altered interception and soil moisture utilization resulting from changes in vegetation condition. He assigned risk to watersheds from changes in cover and evapotranspiration in the form of an equivalent clearcut area as follows: low (< 15%), moderate (15 – 30%) and high (> 30%). The PACFISH B.O. (USDI 1995) identified a 15% ECA as the lower limit threshold of concern for the Umatilla National Forest.

Reviews of literature demonstrate that the relationship is highly variable (Stednick 1995 and Scherer 2001). Generally effects are not seen below 20% ECA and in a local study effects were not seen below 50% ECA (Helvey and Folwer 1995). Grant et al (2008) reported that increased peakflows could occur at ≥20% ECA and that the potential for effects to channel morphology is in the 5-10 year recurrence interval flow ranges.

A GIS database was used to determine past acres harvested, harvest prescriptions, and year of harvest through 2018 and these values were entered into the ECA model (Table 7).

Table 7. Equivalent Clearcut Area Modeling Summary

Subwatershed	Past Treatments	Roads*	Fire	Total ECA
Upper NF Touchet	0.1%	3.1%	10.1%	13.3%
Wolf Fork	0%	0.5%	5.6%	6.1%

*includes ski runs

Subwatersheds in the planning area are below the 15% threshold of concern established by NMFS and the 20% threshold for hydrologic impacts. Based on model assumptions, management induced changes in water yield, timing of flow, or peak flow are currently negligible.

ROADS

Roads have the potential to intercept surface and subsurface water, reducing infiltration and speeding the delivery of water to channels. Sedimentation may be increased by surface erosion from roads and the ability of road drainage to route sediment to channels. Road density alone does not indicate slope position, another critical factor. Valley bottom roads have the most direct effect on streams and riparian areas because of accelerated erosion and loss of streamside shade. Mid-slope roads intercept subsurface runoff, extend channel networks and accelerate erosion, and ridge top roads can influence watershed hydrology by channeling flow into small headwater swales, which may accelerate channel development.

McCammon (1993) assigned three watershed risk classes based on road density (mi/mi^2) to assess the potential of road impacts to adversely affecting hydrologic function and water quality: low (< 3), moderate (3.1-4.5) and high (> 4.5). The Upper North Fork Touchet SWS road density is 1.4 mi/mi^2.

PRESCRIBED BURNING

The Walla Walla Ranger District has an active prescribed burning program. Troendle et al (2010) summarized the hydrological effects of prescribed fire, which are largely a function of fire severity and area burned. Fires are typically set during times when flame lengths are expected to be low, fire residence times short and soil heating expected to be low. Because the low severity of prescribed fires do not cause a high degree of mortality or litter combustion, the effects to overstory canopy, evapotranspiration and forest floor water storage are generally too small to measurably change shade or watershed-scale water yields. Post-burn monitoring by the Umatilla National Forest of the 4,000 acre Bear Prescribed Fire (Pfeifer 2005) found that mineral soil exposure was < 10%, mortality of trees 8"-20" dbh was 13%, mortality of trees 20"- 30" dbh was 8% and there was no mortality of trees > 30" dbh.

A study of the effects of prescribed fire on surface erosion and sedimentation was conducted in the Lick Creek (Pomeroy Ranger District)and Skookum Creek (North Fork John Day Ranger District) drainages from 2002-2005. The study is described in Wondzell and Clifton (2005 and 2009), Zamora and Martin (2006) and Harris et al (2007). They concluded that prescribed fire and fuels treatments in uplands that were conducted under normal operating conditions are unlikely to add measurable amounts of sediment to streams and that BMPs such as not igniting in RHCAs were effective in preventing hillslope erosion from entering into streams. The study is available on the Umatilla National Forest website: https://www.fs.usda.gov/detail/umatilla/landmanagement/resourcemanagement/?cid=stelprdb5208811

3.2.7.3 Impacts Analyses by resource

ALTERNATIVE A

ANALYSES:

Summary: The direct effects of implementing the Alternative A would be the removal of about 50% of the basal area (varies by unit from 30-70%, see Silviculture Report) from 1,150 acres, the development of skid trails, landings and 1.3 miles of temporary road (see Table 8) and noncommercially thinning (hand and mastication) an additional 440 acres. Treatment of activity fuels would include mastication, lop and scatter, hand piling, grapple piling, pile burning, jackpot burning and/or broadcast burning. Prescribed fire is proposed for 1,520 acres of forest, shrubland and grassland (see Table 1, Chapter 1).

Implementation of Alternative A would not cause additional, measureable changes to the direct, indirect or cumulative effects to the resource measures for hydrologic resources. As required by the Clean Water Act and Forest Plan, BMPs that apply to this project are identified in Table 2, Chapter 2.6, Design Elements.

DIRECT AND INDIRECT EFFECTS

HYDROLOGIC FUNCTION

The existing road system would not change in Alternative A (no new roads are proposed and the project would not decommission any National Forest System roads) and temporary road construction would be located and managed such that there would be no effect to the drainage network. Road maintenance would occur on up to 40 miles of system roads used by timber sales and would include blading, ditch relief culvert cleanout, spot rock and ditch cleanout as needed (see Transportation Report). Culvert cleanout and necessary ditch cleanout would lead to immediate reductions in risk from the road system.

Detrimental effects from ditch cleanout would be short term, less than one year. Closed roads would be left in a self-maintaining condition.

Alternative A would require the construction of 1.3 miles of temporary roads to access vegetation treatment units and road density would increase slightly from 1.41 to 1.46 mi/mi^2 until these roads are decommissioned. No temporary roads would occur in RHCAs and using McCammon (1993) as a guide, SWS road densities < 3 mi/mi^2 would constitute a low risk to detrimental impacts to hydrologic function. The road locations would be upslope of where channel formation has occurred in draw bottoms.

Road density in the subwatershed would increase slightly under Alternative A, as a result of temporary road construction, but remain in the low risk category. There would be no increase in roads in RHCAs or number of stream crossings and planned road maintenance would improve drainage from road surfaces, therefore, there would be no direct or indirect effects to hydrologic function in the analysis area.

Within the special use permit boundary for Ski Bluewood, 2.5 miles of existing routes will be required to access several units in Alternative A. National Forest System roads are shown in black and other routes are labeled on Figure 7. Table 8 includes routes that currently exist on the ground and are used by Ski Bluewood to access facilities. Table 9 identifies all temporary roads in the project area. All temporary roads would be decommissioned after use to their pre-existing condition.

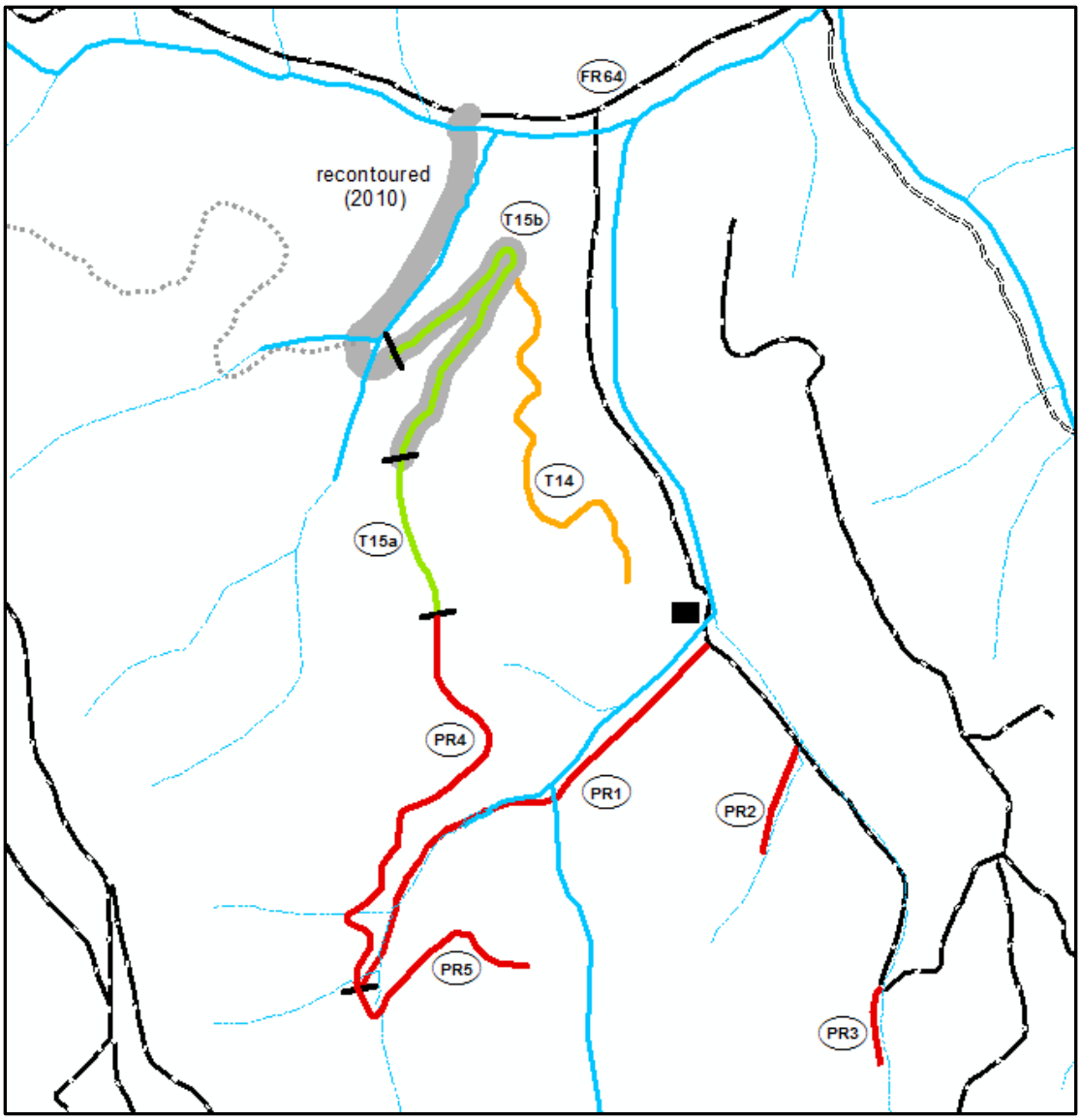


Figure 7. Road ID location for Temporary Roads T14, T15 and PR Roads

Table 8. Upper Touchet Project Nonsystem Haul Roads*

ID	Unit	Miles	Existing	Alt	Comment
PR1	18, 32, 33, 33A, 34A	0.66	Y	A,D	Currently known as Tamarack Ski Run. 2 perennial and 2 intermittent stream crossings. Not identified as a temporary road, but logging traffic will alter current running surface and require surfacing and drainage.
PR2	34A	0.14	Y	A,D	Slalom Ski Run. Not identified as a temporary road, but logging traffic will alter current running surface and require surfacing and drainage.
PR3	35	0.10	Y	A,D	Lower part of Daytona Ski Run. Not identified as a temporary road, but logging traffic will alter current running surface and require surfacing and drainage.

PR4	18	0.61	Y	D	Former FR6400600. Conversion from ML-1 road to decommissioned road when the 3 culverts on perennial streams were removed and the lower mile of this road was decom by full bench recontour under a 2010 decision. Road was left to recover by natural processes. This part of the road accesses top end of Nickel Bowl. Not identified as a temporary road, but logging traffic will alter current running surface and require surfacing and drainage.
PR5	32, 76	0.34	Y	A,D	Former FR6400600. Conversion from ML-1 road to decommissioned road when the 3 culverts on perennial streams were removed and the lower mile of this road was decom by full bench recontour under a 2010 decision. Road was left to recover by natural processes. This part of the road extends east from top of Tamarack Ski Run to Skyline Run.

*Roads would be improved for log haul, then included in Ski Bluewood Special Use Permit for future maintenance.

Table 9. Upper Touchet Project Temporary Roads*

ID	Unit	Miles	Existing	Alt	Comment
T15a	18	0.21	Y	D	Former FR6400600. Conversion from ML-1 road to decommissioned road when the 3 culverts on perennial streams were removed and the lower mile of this road was decom by full bench recontour under a 2010 decision. This part of the road was left to recover by natural processes.
T15b	18	0.51	N	D	Former FR6400600. This part of the road was decommed by full bench recontouring under a 2010 decision. Will require cut and fill construction to access Unit 18. Will be re-recontoured after use.
T14	18	0.57	Y	D	Nonsystem mid-slope road constructed for previous timber sale that was left to recover by natural processes. Extends from full bench decom road 6400600.
T8	33	0.06	N	A,D	Skyline Ski Run.
T9	33	0.07	N	A,D	
T10	33	0.04	N	A,D	Huckleberry Ski Run.
T13	26	0.12	N	A,D	
T11	28, 29	0.11	Y	A,D	
T12	28, 28A	0.20	N	A,D	
T6	12, 12B	0.13	N	A,D	
T7	12A	0.05	Y	A,D	
T5	14	0.07	N	A,D	
T1	03	0.23	N	A,D	
T2	20	0.05	N	A,D	
T3	20	0.08	N	A,D	
T4	20	0.08	N	A,D	

*Roads would be decommissioned by subsoiling. T15b would be decom by full bench recontour.

FLOODPLAINS

There would be no direct or indirect effects to floodplains in the analysis area. The only actions that would occur in floodplains are associated with log haul on existing routes that occur in floodplain areas. Log haul itself would not alter floodplain condition. Danger trees may be cut in floodplains and they would be left on-site where large woody material would help to dissipate stream energy associated with high stream flows.

WATER TEMPERATURE

Water temperature can be increased by reductions in the density of shade over the water surface. Logging activities can initiate pronounced temperature changes by the removal of forest vegetation along channels (Beschta et al 1987). Prescribed burning and hazard tree falling in riparian areas have the potential to reduce existing vegetation. Re-opening non-forest service system roads in riparian areas has the potential to delay the passive recovery of vegetation on roads that are brushed out.

Danger trees would be felled along haul routes used in the proposed timber sales. They would be left on the ground inside RHCAs and commercially removed elsewhere. Most stream crossings on haul routes are ephemeral or intermittent (18 of 21) with no or very low summer flows. Danger trees felled on haul routes within RHCAs of perennial streams would have negligible effect on shade density for affected streams.

Alternative A would not adversely affect water temperature because harvest, thinning and burning would not measurably remove the shade component along any stream channel. Because there would be no change to shade, there would be no adverse effect to beneficial uses and no effect on the 303(d) listing status of streams.

SEDIMENT

HARVEST AND FUELS TREATMENTS

Harvest, thinning and prescribed burning would produce lower short and long term sedimentation rates than a higher severity wildfire based on WEPP model runs and assumed background levels. In addition, the longer term benefit of treatments would be to reduce the severity of future wildfires commensurate with changes to desired fire regime condition classes (see Fuels Report), which would result in lower erosion and sedimentation rates. This effect is expected to last for decades because of the reduced fuel loading from proposed treatments.

PACFISH (1995) reported that the effectiveness of RHCAs in influencing sediment delivery from non-channelized flow was highly variable and concluded that the interim RHCA widths were adequate to protect streams from non-channelized sediment inputs. There would be a low risk of sediment entering into stream channels when design features are implemented.

ROADS

There would be log haul on approximately 6.6 miles of roads within RHCAs, which includes 4.4 miles of paved road. Erosion from increased traffic due to log haul on unpaved roads would be more likely to increase suspended sediment in streams than haul outside of RHCAs. Roads inside RHCAs and with culvert problems are the most likely to contribute sediment to surface waters currently. Sediment modelling of 21 stream crossings on unpaved haul routes shows an increase from 0.6 to 2.1 tons per year from additional logging traffic, depending on BMPs applied (see Table 10). Design features related to timing of activities and installation of physical erosion measures would minimize the risk of erosion in the short term. If stream crossings are surfaced with aggregate and vegetation-lined ditches are not bladed (which exposes and loosens soil), the model estimates that sediment would be reduced to 1 ton.

Table 10. Upper Touchet Project Road Sediment Comparison (tons per year)

Existing traffic	Log Haul		
	Existing road surfacing	Road crossings surfaced, ditches bladed	Road crossings surfaced only
0.6	2.1	1.6	1.0

Road maintenance and reconstruction, followed by closing/stabilizing ML 1 roads and obliteration of new temporary roads would reduce road-related sediment during the longer term. Design features such as halting log haul during wet conditions, adding spot surfacing and blading ditches only where needed, would further mitigate the adverse effects of wet weather or winter haul.

Approximately 1.3 miles of temporary road construction is proposed in Alternative A in the Upper NF Touchet Subwatershed. Temporary roads include 13 segments ranging from 0.04 to 0.23 miles long. Temporary roads would occur on existing disturbed areas such as old skid trails and new construction would occur on stable terrain. All temp routes would be restored to production, as required in the Forest Plan.

Five logging roads constructed during the initial development of Ski Bluewood have not been returned to production, as described in the original EIS (USFS 1973). These routes have been used for administration of ski facilities and are proposed for use to access treatment units and for haul routes (see Figure 7). These routes occur in Tamarack Run (PR1, 0.6 miles), Slalom Run (PR2, 0.2 miles) and Daytona Run (PR3, 0.2 miles), PR4 (part of decom road 6400600) and PR5 (part of decom road 6400600). PACFISH standard and guideline RF-2 for existing and planned roads requires a road management plan to address road management objectives, criteria that govern road operation, maintenance and management, pre- and post-storm inspections, regulation of traffic to minimize erosion and sedimentation to streams, and monitoring plans for road stability, drainage and erosion control. Standard and guideline RF-3 says to reconstruct road and drainage features that do not meet design criteria or operation and maintenance standards. After further development for log haul, these roads would be included in the Ski Bluewood SUP and maintained by the permit holder. All routes are native surface material and require spot surfacing and drainage upgrades to minimize sedimentation. In addition, under its special use permit, Ski Bluewood would also take over maintenance of about 0.6 miles of decommissioned FR6400600 (PR4), which is used to access the upper end of Nickel Bowl from Tamarack Run.

FUELS TREATMENTS AND LANDSCAPE PRESCRIBED FIRE

No mechanical or hand thinning would occur in RHCAs. No ignition would take place inside RHCAs during landscape burning, though fire would be allowed to back into RHCAs**;** there would be very little effect to existing down material and vegetation density in near channel positions. WEPP modeling indicates that prescribed fire would remain near background levels.

WATER YIELD

Direct and indirect effects to water yield could occur if expansion of the road network increases landscape dissection and effectively routes water off the landscape via the road system. Additional effects could occur if road-stream interactions increase such that the road system becomes an extension of the stream network. Alternative A would add 1.3 miles of temporary road in the Upper North Fork Touchet subwatershed and temporarily increase road density from 1.41 to 1.46 mi/mi^2. All temporary roads would occur in upland areas, above the point on the landscape in which snowmelt or rainfall runoff enters into a defined channel. Road density would remain in the low risk category and there would be no new road crossings that would extend the stream network farther into upland areas. There would be no changes to the road system in the Wolf Fork subwatershed. As a result, there would be no

measureable increase in streamflow at the subwatershed scale. Therefore there would be no direct or indirect effect to water yield or peak flows from these actions under this alternative.

CUMULATIVE IMPACTS ANALYSES:

Effects of past harvest and road building, proposed harvest, and landscape burning on water yield and peak flows were analyzed with the Equivalent Clearcut Area (ECA) Model as described in the *Existing Condition* section of this report. The largest contributor to the current level of ECA is due to legacy mortality from the Columbia Complex Fire, which accounts for about 10% of the ECA in the Upper North Fork Touchet SWS. The combined effects of past actions, current actions and actions proposed under this alternative would result in ECA percentage increases that exceed the 15% threshold identified in the NMFS biological opinion for PACFISH. ECA for would not exceed the 20% level at which effects to water yield, peakflows, or timing of peakflows, have been reported in various studies (see Existing Condition).

Implementation of Alternative A would increase modeled cumulative watershed effects from 13.3% ECA to 18.4% ECA in the Upper North Fork Touchet SWS, assuming all actions would occur in the same year. ECA would return to below the Forest Plan 15% standard by the end of the 4th year after treatments. The temporary addition of about 2.2 acres of temporary road would add a negligible amount to overall ECA. Because ECA would remain below 20%, morphological stream channel changes which could affect stream temperature would not occur in the Upper North Fork Touchet subwatershed as a result of Alternative A.

ECA model results for the Wolf Fork SWS would remain below threshold values, therefore, no adverse changes to channel condition from silvicultural treatments are predicted because water yield and peak flow will not be affected, and morphological stream channel changes which could affect stream temperature would not occur.

Based on the assumptions of the ECA model and the literature cited, the proposed harvest and landscape burning would not have a measurable effect to hydrologic functions (capture, storage, and release of water) in the Upper North Fork Touchet and Wolf Fork subwatersheds when combined with past actions, assuming all activities occurred at the same time. Because all actions would not occur at the same time and the burned forest would continue to recover, the cumulative effects of the alternatives would be less than shown in Table 11. As a result, stream channel morphology and streambank stability would not be altered (see Fisheries Report).

Table 11. Upper Touchet Project Equivalent Clearcut Area Summary

Subwatershed	Existing	Alt A	Alt B	Alt D
Upper NF Touchet	13.3%	18.4%	18.4%	18.4%
Wolf Fork	6.1%	6.9%	6.9%	7.1%

Road construction and fire have reduced shade along the North Fork Touchet River. This may have an impact on the current temperature of water in that area. Maintenance of RHCA buffers and no new disturbance in RHCAs area will allow vegetation to grow to maturity, offering more effective shade. Therefore, there will be no long term negative cumulative impacts to effective shade or stream temperature from this alternative.

The proper maintenance of roads and culverts will reduce sedimentation risks of the existing road system, and storage or decommissioning of roads, skid trails, landings and non-system roads will reduce the amount of sedimentation available for transport to streams. Therefore, there will be no long term

negative cumulative impacts to sedimentation from the proposed action. WEPP modeling of hillslope erosion indicates that sedimentation from silvicultural treatments and prescribed burning would produce sediment amounts similar to background levels and that wildfire could increase sedimentation from 19 t/mi^2 to 1100 t/mi^2. If the vegetation treatments implemented reduce the severity and extent of landscape fire (see purpose and need), then future fires would be expected to burn with lower severity, which would have a positive long term effect on hillslope sedimentation.

CONCLUSION:

Existing roads, landings and skid trails increase risk of sedimentation to streams, especially North Fork Touchet River, which is valuable salmonid habitat. Proper post-harvest closure of system roads and decommissioning of non-system roads would reduce this risk for the future. A brief sediment pulse will occur from ground-disturbing activities such as road maintenance and closure, and this will quickly be flushed through the system in the following winter with no long-term negative impacts. Stream shade levels will not be impacted by the proposed activities and stream temperatures will likely remain consistent with past temperatures. Likewise, no impacts to stream morphology is anticipated in the analysis area. Future wildfire risk will decline as forest fuels are removed. If forest treatments reduce the risk of future wildfire extent and severity from high to low, the slight increase in erosion associated with the proposed activities will be offset by the reduced risk of fire.

ALTERNATIVE B

ANALYSES:

DIRECT, INDIRECT AND CUMULATIVE EFFECTS

Summary: The direct effects of implementing the Alternative B would be the removal of about 50% of the basal area (varies by unit from 30-70%, see Silviculture Report) from 1,150 acres, the development of skid trails and landings and noncommercially thinning (hand and mastication) an additional 440 acres. Treatment of activity fuels would include mastication, lop and scatter, hand piling, grapple piling, pile burning, jackpot burning and/or broadcast burning. Prescribed fire is proposed for 1,520 acres of forest, shrubland and grassland (see Table 1, Chapter 1). Alternative B would not require the use or construction of temporary roads, therefore, the direct, indirect and cumulative effects of this alternative would be slightly less than for Alternative A.

Implementation of Alternative B would not cause additional, measureable changes to the direct, indirect or cumulative effects to the resource measures for hydrologic resources. As required by the Clean Water Act and Forest Plan, BMPs that apply to this project are identified in Table 2, Chapter 2.6, Design Elements.

CONCLUSION:

See Alternative A

ALTERNATIVE D

ANALYSES:

Summary: The direct effects of implementing the Alternative D would be the removal of about 50% of the basal area (varies by unit from 30-70%, see Silviculture Report) from 1,205 acres, the development of skid trails, landings and 2.6 miles of temporary road, and noncommercially thinning (hand and mastication) an additional 362 acres. Treatment of activity fuels would include mastication, lop and scatter, hand piling, grapple piling, pile burning, jackpot burning and/or broadcast burning. Prescribed fire is proposed for 1,520 acres of forest, shrubland and grassland (see Table 1, Chapter 1). As required

by the Clean Water Act and Forest Plan, BMPs that apply to this project are identified in Table 2, Chapter 2.6, Design Elements.

Direct, indirect and cumulative effects to resource measures would be similar to Alternative A, but slightly lower higher due to more temporary road construction (2.6 miles vs 1.3 miles). The difference between silvicultural treatments, logging systems and transportation routes between Alternatives A and D (see Table 1, Chapter 1) would not cause additional, measureable changes to the direct and indirect effects described under Alternative A.

DIRECT AND INDIRECT EFFECTS

HYDROLOGIC FUNCTION

The existing road system would not change in Alternative D (no new roads are proposed and the project would not decommission any National Forest System roads) and temporary road construction would be located and managed such that there would be no effect to the drainage network.

Alternative D would require the construction of 2.6 miles of temporary roads to access vegetation treatment units and road density would increase slightly from 1.41 to 1.51 mi/mi^2 until these roads are decommissioned. No temporary roads would occur in RHCAs and using McCammon (1993) as a guide, SWS road densities < 3 mi/mi^2 would constitute a low risk to detrimental impacts to hydrologic function. The road locations would be upslope of where channel formation has occurred in draw bottoms.

Road density in the subwatershed would increase slightly under Alternative D, as a result of temporary road construction, but remain in the low risk category. There would be no increase in roads in RHCAs or number of stream crossings and planned road maintenance would improve drainage from road surfaces, therefore, there would be no direct or indirect effects to hydrologic function in the analysis area.

Within the special use permit boundary for Ski Bluewood, 2.4 miles of existing routes (PR1-5) and temporary roads (T5, 8, 9, 10, 11, 12) will be required to access several units in Alternative D (refer to Figure 7 and Tables 8 and 9).

In Alternative D, for skyline operations in Unit 18, 1.9 miles of access and log haul roads would be required (PR4, T14, T15). Former FR6400600 was decommissioned under a previous decision (USFS 2010) and the lower 0.95 miles of this road were restored by removing culverts and full bench recontouring to restore surface and subsurface flow patterns. The upper 1.05 miles was left to recover by natural processes. Alternative D would re-open 1.33 miles of this road outside of the RHCA. Cut and fill construction would be needed for segment T15b. The re-opened road would be used to access T14. In addition, under its special use permit, Ski Bluewood would take over maintenance of about 0.6 miles of decommissioned FR6400600 (PR4), which is used to access the upper end of Nickel Bowl from Tamarack Run. The 0.72 mile portion (T15a and T15b) of road not to be maintained by Ski Bluewood would be once again decommissioned to restore the land to productivity. All temporary roads would be decommissioned after use to their pre-existing condition. See Figure 7 for location of these roads.

FLOODPLAINS

Same as Alternative A

WATER TEMPERATURE

Same as Alternative A

SEDIMENT

HARVEST AND FUELS TREATMENTS

Same as Alternative A

ROADS

Approximately 2.6 miles of temporary road construction involving is proposed in Alternative D in the Upper NF Touchet Subwatershed. Temporary roads include 16 segments ranging from 0.05 to 0.57 miles long. Temporary roads would occur on existing disturbed areas such as old skid trails and new construction would occur on stable terrain. All temp routes would be restored to production, as required in the Forest Plan.

Direct and indirect effects would be the same as Alternative A.

FUELS TREATMENTS AND LANDSCAPE PRESCRIBED FIRE

Same as Alternative A.

WATER YIELD

Alternative D would add 2.6 miles of temporary road in the Upper North Fork Touchet subwatershed and temporarily increase road density from 1.41 to 1.51 mi/mi^2. All temporary roads would occur in upland areas, above the point on the landscape in which snowmelt or rainfall runoff enters into a defined channel. Road density would remain in the low risk category and there would be no new road crossings that would extend the stream network farther into upland areas. There would be no changes to the road system in the Wolf Fork subwatershed. As a result, there would be no measureable increase in streamflow at the subwatershed scale. Therefore there would be no direct or indirect effect to water yield or peak flows from these actions under this alternative.

CUMULATIVE IMPACTS ANALYSES:

The combined effects of past actions, current actions and actions proposed under this alternative would result in ECA percentage increases that exceed the 15% threshold identified in the NMFS biological opinion for PACFISH. ECA for would not exceed the 20% level at which effects to water yield, peakflows, or timing of peakflows, have been reported in various studies (see Existing Condition).

Implementation of Alternative D would increase modeled cumulative watershed effects from 13.3% ECA to 18.4% ECA in the Upper North Fork Touchet SWS, assuming all actions would occur in the same year. ECA would return to below the Forest Plan 15% standard by the end of the 4th year after treatments. The temporary addition of about 4.5 acres of temporary road would add a negligible amount to overall ECA. Because ECA would remain below 20%, morphological stream channel changes which could affect stream temperature would not occur in the Upper North Fork Touchet subwatershed as a result of Alternative D.

ECA model results for the Wolf Fork SWS would remain below threshold values, therefore, no adverse changes to channel condition from silvicultural treatments are predicted because water yield and peak flow will not be affected, and morphological stream channel changes which could affect stream temperature would not occur.

Based on the assumptions of the ECA model and the literature cited, the proposed harvest and landscape burning would not have a measurable effect to hydrologic functions (capture, storage, and release of water) in the Upper North Fork Touchet and Wolf Fork subwatersheds when combined with past actions, assuming all activities occurred at the same time. Because all actions would not occur at the same time and the burned forest would continue to recover, the cumulative effects of the

alternatives would be less than shown in Table 1. As a result, stream channel morphology and streambank stability would not be altered (see Fisheries Report).

Road construction and fire has reduced shade along the North Fork Touchet River. This may have an impact on the current temperature of water in that area. Maintenance of RHCA buffers and no new disturbance in RHCAs area will allow vegetation to grow to maturity, offering more effective shade. Therefore, there will be no long term negative cumulative impacts to effective shade or stream temperature from this alternative.

The proper maintenance of roads and culverts will reduce sedimentation risks of the existing road system, and storage or decommissioning of roads, skid trails, landings and non-system roads will reduce the amount of sedimentation available for transport to streams. Therefore, there will be no long term negative cumulative impacts to sedimentation from the proposed action. WEPP modeling of hillslope erosion indicates that sedimentation from silvicultural treatments and prescribed burning would produce sediment amounts similar to background levels and that wildfire could increase sedimentation from 19 t/mi^2 to 1100 t/mi^2. If the vegetation treatments implemented reduce the severity and extent of landscape fire (see purpose and need), then future fires would be expected to burn with lower severity, which would have a positive long term effect on hillslope sedimentation.

CONCLUSION:

Same as Alternative A.

ADDENDUM 1

UPPER NORTH FORK TOUCHET RIVER - PAST ACTIVITIES RELATED TO WATERSHED CONDITION (not including vegetation projects or road construction)

Year	Activity
1978	Ski Bluewood constructed (buildings, ski runs, roads, parking area). Bluewood Creek and tributaries piped beneath roads and parking lot.
1980s	sediment catch basin ponds constructed in Bluewood Creek downstream of parking lot below pipe (have since filled in)
	log weirs placed downstream of large culverts on North Fork Touchet River to improve fish passage by backwatering low flow (all culverts have since been replaced to allow aquatic organism passage at all stages)
1996	Flood overtops and washes out portions of FR64. Assessment for additional ditch relief culverts recognized post-flood while post-flood repairs conducted. Assessments for upgrade of several undersized culverts in the main channel recognized post-flood while post-flood repairs conducted.
1998	USFWS B.O. Terms and Conditions on Ski Bluewood Road Use Permit-required development of monitoring plan for sediment and bull trout redd surveys (ongoing since 1994); seek opportunities for funding to pave FR64 and Ski Bluewood parking lot to reduce chronic sediment inputs from snow plowing, gravel resurfacing, road grading, visitor use and winter sanding.
2000	NMFS B.O. Term and Condition on Ski Bluewood Road Use Permit (until such time that FR64, the access road and parking areas to Ski Bluewood are paved, all graveled surfaces must be kept well graveled to minimize erosion from the road into the stream)
2004	Tamarack ski run erosion control- Consisted of repair of eroding service road on ski run (lower Tamarack Trail). Included installation of three new culverts and replacement of a fourth. Stream is perennial, but not fish-bearing. Spring flows down east side of the run in

	the service road, was creating small vertical gully for 200 feet, the service road intercepted other headwater springs feeding the gully and delivering sediment into Bluewood Creek tributary downstream. (Culverts have now been removed)
	NEPA completed for numerous projects to reduce recreation-related impacts to the watershed
2005	FR64 paved (7.25 miles), four of 6 user-created access routes to the river were closed by steepening the fill slope and using large rocks prior to paving. One of three user-developed access roads above FR 6400 was also blocked as result of the paving project. 35 ditch relief culverts replaced and upsized, 12 additional new ditch relief culverts installed.
	FR64 - 2 culverts replaced with bridges
	Sno-park relocated away from river
	ATV/snowmobile log stringer bridge removed and trail re-routed out of RHCA
	Touchet Corral ATV/snowmobile trailhead vault toilet installed on FR 64 on cutslope outer side of the road, eliminating dispersed rec human waste impacts on the stream side of the road in RHCA.
	Touchet Corral/Middle Tie Trail ford across tributary replaced with trail bridge, trail hardened and drainage improved, user safety increased, vehicles no longer getting stuck
	Middle Point Ridge Trailhead vault toilet installed
2006	Columbia Complex Fire burns 76% of subwatershed (< 10% high soil burn severity)
2010	FR6400-700 culvert replaced with bridge (Touchet Corral)
	FR6400-600 culvert removed (upstream-most); 0.8 miles of road decommissioned
	Columbia Complex Fire Road Decommissioning upper Lewis Creek – 5.6 miles
	FR6400-650 culvert replaced with bottomless arch (Ski Bluewood access road)
2014	Motorized Trail 3243 – construct drivable dips with aggregate surfacing
2016	FR64 dispersed rec sites along old access road – rock barriers installed
	Motorized Trail 3243 - log stringer bridge replaced with new wooden bridge

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3.2.8 Fish Biology

3.2.8.1 Affected Environment

3.2.8.2 Relevant Laws, Regulations, Policies, Guidance, and Plans for Silviculture

3.2.8.3 Methodology

3.2.8.4 Impacts Analyses by resource

ALTERNATIVE A – PROPOSED ACTION ALTERNATIVE

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

ALTERNATIVE B – NAME OF ALTERNATIVE B

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

ALTERNATIVE D – NAME OF ALTERNATIVE D

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

3.2.9 Socio-Economics

3.2.9.1 Affected Environment

3.2.9.2 Relevant Laws, Regulations, Policies, Guidance, and Plans for Silviculture

3.2.9.3 Methodology

3.2.9.4 Impacts Analyses by resource

ALTERNATIVE A – PROPOSED ACTION ALTERNATIVE

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

ALTERNATIVE B – NAME OF ALTERNATIVE B

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

ALTERNATIVE D – NAME OF ALTERNATIVE D

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

3.2.10 Invasive Plants

3.2.10.1 Affected Environment

3.2.10.2 Relevant Laws, Regulations, Policies, Guidance, and Plans for Silviculture

3.2.10.3 Methodology

3.2.10.4 Impacts Analyses by resource

ALTERNATIVE A – PROPOSED ACTION ALTERNATIVE

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

ALTERNATIVE B – NAME OF ALTERNATIVE B

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

ALTERNATIVE D – NAME OF ALTERNATIVE D

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

3.2.11 Air Quality
3.2.11.1 Affected Environment
3.2.11.2 Relevant Laws, Regulations, Policies, Guidance, and Plans for Silviculture
3.2.11.3 Methodology
3.2.11.4 Impacts Analyses by resource
ALTERNATIVE A – PROPOSED ACTION ALTERNATIVE

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

ALTERNATIVE B – NAME OF ALTERNATIVE B

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

ALTERNATIVE D – NAME OF ALTERNATIVE D

ANALYSES:

CUMULATIVE IMPACTS ANALYSES:

CONCLUSION:

3.2.12 Botany
Describe findings and in brief why not analyzed in detail

3.2.13 Heritage /Cultural Resources
Describe findings and in brief why not analyzed in detail

3.3 Cumulative Impacts

CHAPTER 4 CONSULTATION AND COORDINATION
4.1 Agency Consultation
4.2 Native American / Tribal Consultation
4.3 Public Involvement

REFERENCES
DO NOT PUT ANY REFERENCES DIRECTLY INTO THIS SECTION. IT WILL BE AUTO POPULATED FROM YOUR INPUT CITATIONS USING REFERENCES CITATIONS

FINDING OF NO SIGNIFICANT IMPACT

As the deciding official, I am responsible for evaluating the effects of the project relative to the definition of significance established by the CEQ Regulations (40 CFR 1508.13). I have reviewed and considered the EA and documentation included in the project record, and I have determined that the proposed action and alternatives will not have a significant effect on the quality of the human environment. As a result, no environmental impact statement will be prepared. My rationale for this finding is as follows, organized by sub-section of the CEQ definition of significance cited above.

Context

For the proposed action and alternatives the context of the environmental effects is based on the environmental analysis in this EA.

Intensity

Intensity is a measure of the severity, extent, or quantity of effects, and is based on information from the effects analysis of this EA and the references in the project record. The effects of this project have been appropriately and thoroughly considered with an analysis that is responsive to concerns and issues raised by the public. The agency has taken a hard look at the environmental effects using relevant scientific information and knowledge of site-specific conditions gained from field visits. My Finding Of No Significant Impact is based on the context of the project and intensity of effects using the ten factors identified in 40 CFR 1508.27(b).

1. Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.
2. The degree to which the proposed action affects public health or safety.
3. Unique characteristics of the geographic area such as the proximity to historical or cultural resources, parklands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.
5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
6. The degree to which the action may establish precedent for future actions with significant effects or represents a decision in principle about a future consideration.
7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.
10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

APPENDICES